Data on Particles and Resonant States*

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Data and references on properties of particles and resonances are compiled, tested for consistency, and summarized in tables and wallet cards. This is an updating of the *Reviews of Modern Physics* article of October 1964, and some new quantities have been included in the tables.

This data survey is an updating of that of one year ago.[1] To save space we discuss only the changes since then, and omit the descriptions of the tables and compiling procedures. However, we do want to re-emphasize the warning carried by the entries "× Scale =···." As an example, consider the $A2$ meson, whose mass is listed as 1324±9× Scale =2.5 MeV. This means that the masses used in arriving at the weighted average of 1324±9 MeV are inconsistent, and have a chi-squared larger than expected by a factor of 2.5[2]. In UCRL 8030[2] we present ideograms of all the sets of input data which have abnormally large chi squareds, and the ideogram for the $A2$ mass is double-humped, showing that the 9-MeV calculated error of the average is absurdly unrealistic. The reader can look at the ideogram and decide for himself which experiments to bet on. If he chooses not to do this, he should *at least* take the point of view that all the input errors are equally underestimated (by a factor of 2.5), and take the calculated error to be 9 MeV ×2.5, i.e., about 22 MeV.

Wallet cards in two sizes are available from Lawrence Radiation Laboratory, University of California, Berkeley, California.

CHANGES IN TABLE S (STABLE PARTICLES)

We have added magnetic moments to Table S, and decay parameters of hyperons to Table S-Decay.

A new measurement by Shafer, Crowe, and Jenkins (SHAFER 65) has reduced the error on the charged pion mass from 50 to 15 keV. This result affects the mass of all the other mesons and hyperons to a small extent. For an up-to-date review, see the article by Barkas.[3]

CHANGES IN THE MESON TABLE

In the meson table we have listed several states for which it has not been shown that they have well-defined quantum numbers (D, E, $A1$, B, κ, C). Alternative explanations have been put forward for the $A1$,[4–7] the B,[8] and the κ.[9]

Because of their current interest, we have added information on possible C-violating decay modes.

CHANGES IN THE BARYON TABLE

New useful quantities have been added in this table. In the second column of the table we give both kinetic energy and momentum of the π or K beam (incident on a proton), out of which these resonances can be directly formed. In addition to the mass squared of the resonance, we give now also $\Gamma(M^2)$. On a mass-squared scale, this quantity is equivalent to the full width of the resonance; i.e., $\Gamma(M^2)=2M\Gamma(M)$.

SU(3) ASSIGNMENTS

A large fraction of the particles with known spin and parity has been successfully grouped into SU(3) multiplets.

Among the *baryons* the N, Λ, Σ, and Ξ are assigned to a $J^P=\frac{1}{2}^+$ octet, satisfying the Gell-Mann–Okubo mass formula[10]:

$$\tfrac{1}{2}(M_N+M_\Xi)=\tfrac{1}{4}(3M_\Lambda+M_\Sigma). \quad (1)$$

The $N_{\frac{3}{2}}^*(1238)$, $Y_1^*(1385)$, $\Xi^*(1530)$, and Ω^- are assigned to a $\frac{3}{2}^+$ decuplet satisfying the equal mass spacing rule.

Among the *mesons* nine 0^- states (π, K, η, X^0), and

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TABLES FROM UCRL-8030(rev.)

Table S – Stable particles

							Important decays			
	$I(J^{PG})C$	Mass (MeV)	Mass difference (MeV)	Mean life (sec)	$Mass^2$ $(BeV)^2$	Magnetic moment $(e/2m_p)$	Partial mode	Fraction	Q (MeV)	p or p_{max} (MeV/c)
LEPTONS										
γ	$J^P=1^-C^-$			stable	0		stable			
ν_e	J=1/2	0(<0.2 keV)		stable	0		stable			
ν_μ		0(<2.5 MeV)			0					
$e^\mp$	J=1/2	0.511006 ±0.000002		stable	0.000	1.0011609 † ±.0000024	stable			
$\mu^\mp$	J=1/2	105.659 ±0.002	-33.95 ±0.05	2.2001×10^{-6} ±.0008 ×scale=2.5	0.011	[1.001162 ±.000005 in $e/2m_\mu$]	$e\nu\bar{\nu}$	100%	105.15	52.8
MESONS										
$\pi^\pm$	$1(0^{--})C_n^+$	139.580 ±0.015	4.6056 ±0.0055	2.551×10^{-8} ±.026	0.019		$\mu\nu$	100%	33.92	29.80
							$e\nu$	(1.24±.03)10-4	139.07	69.80
							$\mu\nu\gamma$	(1.24±.25)10-4	33.92	29.80
							$\pi^0 e\nu$	(1.11±.08)10^{-8}	4.09	4.50
π^0		134.974 ±0.015		1.78×10^{-16} ±.26 ×scale=1.3	0.018		$\gamma\gamma$	98.8	135.00	67.50
							γe^+e^-	(1.19±.05)%	133.95	67.49
$K^\pm$	1/2(0⁻)	493.78 ±0.17	-3.90 ±0.25	1.229×10^{-8} ±.008	0.244		$\mu\nu$	(63.2±.4)% ×scale=1.4	388.1	235.6
							$\pi^\pm\pi^0$	(21.3±.4)%	219.2	205.2
							$\pi^\pm\pi^-\pi^+$	(5.5±.1)%	75.0	125.5
							For other decays see Table S-Decay			
K^0		497.7 ±0.30		50%K1, 50%K2						
K_1			-0.91×1/τ_1 ±0.07 ×scale=2.3	0.881×10^{-10} ±.010 ×scale=1.4	0.248		$\pi^+\pi^-$	(68.5±1.0)%	218.5	206.0
							$\pi^0\pi^0$	(31.5±1.0)%	227.8	209.1
K_2				5.77×10^{-8} ±.59	0.248		$\pi^0\pi^0\pi^0$	(24.8±3.0)%	92.8	139.3
							$\pi^+\pi^-\pi^0$	(13.6±1.0)%	83.6	132.8
							$\pi\mu\nu$	(26.2±2.6)%	252.5	216.0
							$\pi e\nu$	(35.4±2.7)%	357.6	229.3
							$\pi^+\pi^-$	(2.1±0.3)$\times10^{-3}$	218.5	206.0
η	$0(0^{-+})C^+$	548.8 ±0.5		$\Gamma < 10$ MeV	0.301		$\gamma\gamma$	(38.6±2.7)% ×scale=1.4	548.7	274.3
							$3\pi^0$ or $\pi^0 2\gamma$	(30.8±2.3)%	143.8	179.5
							$\pi^+\pi^-\pi^0$	(25.0±1.6)%	134.8	174.4
							$\pi^+\pi^-\gamma$	(5.5±1.2)%	269.5	236.2
							$\pi^0 e^+e^-$	<(1.1±1.1)%	412.7	257.7
BARYONS										
p	1/2(1/2⁺)	938.256 ±0.005	-1.2933 ±0.0001	stable	0.880	2.792816 ±.000034				
n		939.550 ±0.005		1.01×10^3 ±.03	0.882	-1.913148 ±.000066	$pe^-\nu$	100%	0.78	1.19
Λ	$0(1/2^+)$	1115.44 ±0.12 ×scale=1.2		2.61×10^{-10} ±.02 ×scale=1.5	1.242	-0.73 ±0.17	$p\pi^-$	(66.3±1.0)%	37.6	100.2
							$n\pi^0$	(33.6±1.0)% ×scale=1.3	40.9	103.7
							For other decays see Table S-Decay			
Σ^+	$1(1/2^+)$	1189.39 ±0.14	7.90 ±0.09	0.794×10^{-10} ±.026	1.415	4.3±1.5	$p\pi^0$	51.0±2.4%	116.2	189.0
							$n\pi^+$	49.0±2.4%	110.3	185.0
							For other decays see Table S-Decay			
Σ^0		1192.3 ±0.2		<1.0×10-14	1.422		$\Lambda\gamma$	100%	77.0	74.5
							See Table S-Decay			
Σ^-		1197.20 ±0.14	4.86 ±0.07	1.58×10^{-10} ±.05	1.433		$n\pi^-$	100%	118.1	192.8
							For other decays see Table S-Decay			
Ξ^0	1/2(1/2⁺) ?	1314.3 ±1.0	6.5 ±1.0	3.05×10^{-10} ±.38 ×scale = 1.3	1.727		$\Lambda\pi^0$	100%	63.9	134.8
							For other decays see Table S-Decay			
Ξ^-		1320.8 ±0.2		1.75×10^{-10} ±.05	1.745		$\Lambda\pi^-$	100%	65.8	138.7
							$\Lambda e^-\nu$	$\leq 1.7\times10^{-3}$	204.9	189.4
		×scale = 1.2		×scale = 1.1			$n\pi^-$	$<5\times10^{-3}$	241.7	303.0
Ω^-	0(3/2⁺) ? ?	1675 ±3		1.3×10^{-10} ±.7	2.806		$\Xi\pi$	?	221	296
							$\Lambda\bar{K}$	?	66	216

†In units of $(e/2m_e)$.

A. H. Rosenfeld, A. Barbaro-Galtieri, W. H. Barkas, P. L. Bastien, J. Kirz, and M. Roos, UCRL-8030 - Part I, August, 1965.

Table S–Decay

An Appendix to Table S for decay parameters and branching fractions

	Partial mode	Fraction	Q (MeV)	p or p_{max} (MeV/c)	α†	β†	γ†	Δ†
$K^{\pm}$	$\mu^{\pm}\nu$	(63.2 ±.4)%	388.1	235.6				
	$\pi^{\pm}\pi^{0}$	(21.3 ±.4)%	219.2	205.2				
	$\pi^{\pm}\pi^{+}\pi^{-}$	(5.52±.08)%	75.0	125.5				
	$\pi^{\pm}\pi^{0}\pi^{0}$	(1.68±.05)%	84.3	133.0				
	$\pi^{0}\mu^{\pm}\nu$	(3.4 ±.2)%	253.1	215.2				
	$\pi^{0}e^{\pm}\nu$	(4.9 ±.2)%	358.3	228.4				
	$\pi^{\pm}\pi^{\mp}e^{\pm}\nu$	(4.3 ±.9)10^{-5}	214.1	203.5				
	$\pi^{\pm}\pi^{\pm}e^{\mp}\nu$	<0.1 ×10^{-5}	214.1	203.5				
	$\pi^{\pm}\pi^{0}\gamma$	(2.2 ±0.7)10^{-4}	219.2	205.2				
	$\pi^{\pm}\pi^{\mp}\mu^{\pm}\nu$	≤1.2 ×10^{-5}	109.0	151.1				
	$\pi^{\pm}e^{+}e^{-}$	<1.1 ×10^{-6}	353.2	227.2				
	$\pi^{\pm}\mu^{+}\mu^{-}$	<3 ×10^{-6}	142.9	171.9				
	$e^{\pm}\nu$	<1.6 ×10^{-3}	493.3	246.9				
	$\pi^{\pm}\pi^{+}\pi^{-}\gamma$	(9 ±4)10^{-5}	75.0	125.5				
Λ	$p\pi^{-}$	(66.3 ±1.0)% ×scale	37.6	100.2	+0.659±0.047			(15±20)°
	$n\pi^{0}$	(33.6 ±1.0)% =1.2	40.9	103.7				
	$p\mu\nu$	(1.5 ±1.2)10^{-4}	71.5	130.8				
	$pe\nu$	(0.88±.08)10^{-3}	176.7	163.1				
		×scale = 1.3						
Σ^{+}	$p\pi^{0}$	(51.0 ±2.4)%	116.2	189.0	-0.79±.09			
	$n\pi^{+}$	(49.0 ±2.4)%	110.3	185.1	-0.05±0.08			
	$n\pi^{+}\gamma$	≈0.2 ×10^{-4}	110.3	185.1				
	$\Lambda e^{+}\nu$	≈0.2 ×10^{-4}	73.4	71.6				
	$p\gamma$	(3.7 ±0.8)10^{-4}	251.1	224.6				
	$n\mu^{+}\nu$	<1.1 ×10^{-4}	144.2	202.4				
	$ne^{+}\nu$	<0.5 ×10^{-4}	249.3	223.6				
Σ^{0}	$\Lambda\gamma$	100%	77.0	74.5				
Σ^{-}	$n\pi^{-}$	100%	118.1	192.8	-0.16±.21			
	$n\pi^{-}\gamma$	≈0.1 ×10^{-4}	118.1	192.8				
	$n\mu^{-}\nu$	(0.66±.15)10^{-3}	152.0	209.4				
	$ne^{-}\nu$	(1.2 ±0.2)10^{-3}	257.1	229.9				
	$\Lambda e^{-}\nu$	(0.75±.28)10^{-4}	81.2	79.0				
Ξ^{0}	$\Lambda\pi^{0}$	≈100%	63.9	134.8	-0.34±.12	0.05	0.94	(8±62)°
	$p\pi^{-}$	<2.7%	236.5	298.7				
	$pe^{-}\nu$	<2.7%	375.5	322.2				
	$\Sigma^{+}e^{-}\nu$	<1.3%	124.4	119.0				
	$\Sigma^{-}e^{+}\nu$		116.6	111.9				
Ξ^{-}	$\Lambda\pi^{-}$	100%	65.8	138.7	-0.410±.046	+0.12	0.90	(-17±18)°
	$\Lambda e^{-}\nu$	≤1.7 ×10^{-3}	204.9	189.4				
	$n\pi^{-}$	<5×10^{-3}	241.7	303.0				

† The definition of these quantities is taken as follows:

$$\alpha = \frac{2\,\mathrm{Re}(S^{*}P)}{|S|^{2}+|P|^{2}}\,; \qquad \beta = \frac{2\,\mathrm{Im}(S^{*}P)}{|S|^{2}+|P|^{2}}\,; \qquad \gamma = \frac{|S|^{2}-|P|^{2}}{|S|^{2}+|P|^{2}}\,; \qquad \tan\Delta = \frac{\beta}{\alpha}\,.$$

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Mesons

	Mass (MeV)	$I(J^{PG})CA$ ⊢⊣=estab.	Symbol	Γ (MeV)	$\Gamma/(M^2)$ $(BeV)^2$	Important decays: Partial modes	Fraction (%)	Q (MeV)	p_{max} or p_{max} (MeV/c)
η	548.9 ±0.5	$0(0^{-+})C^+A^-$ ⊢⊣	η_β	<10	0.301 < 0.01	See Table S			
ω	782.8 ±0.5 Xscale=1.9	$0(1^{--})C^-A^-$ ⊢⊣	η_γ	12.0 ±1.7 Xscale=1.2	0.613 0.019	$\pi^+\pi^-\pi^0$	88	369	327
						$\pi^+\pi^-$	seen †	504	366
						neutral($\pi^0\gamma$)	10.6±1	648	380
						η+neutral	<1.7	234	199
						$\pi^+\pi^-\gamma$	<5	504	366
						e^+e^-	≈0.01	782	391
						$\mu^+\mu^-$	<0.10	572	377
X^0 or η′	958.6 ±1.6	$0(0^{-+})C^+A^-$ ⊢⊣	η_β	<4	0.920 <0.008	$\eta\pi\pi$	76±4	131	232
						$\pi^+\pi^-\gamma$	24±4	680	459
						Xscale=1.2			
K_1K_1	≈1000	May be just large $\bar{K}K$ scattering length, see listings of data cards.							
φ	1019.5 ±0.3 Xscale=1.7	$0(1^{--})C^-A^+$ ⊢⊣	η_γ	3.3 ±0.6	1.039 0.007	K_1K_2	38±3	23	109
						K^+K^-	30±3	32	126
						$\pi\rho+3\pi$	32±8	117	188
						Xscale=1.4			
						$\pi^0\gamma$		885	501
						η+neutral	<12	471	362
						$\mu^+\mu^-$	<0.5	808	499
						e^+e^-	<0.4	1018	510
f	1253 ±20	$0(2^{++})C^+A^+$ ⊢⊣	η_a^{II}	118 ±16	1.571 0.294	ππ	large	974	611
						4π	<4	695	547
						$\bar{K}K$	<4	265	386
D	1286 ±6	$0(1^{++})C^+A^-$	η	40 ±10	1.65 0.105	$K\bar{K}\pi$		154	303
E (a)	1420 ±10	0( )CA^- ??	η	60 ±10	2.02 0.17	$K\bar{K}\pi$	large	35 293	151 430
f′	1500	$0(2^{++})C^+A$ ⊢⊣	η_a^{II}	80	2.25 0.24	K_1K_1		505	561
						$K\bar{K}^*(890)$		111	274
$\pi^\pm$	139.6	$1(0^{-+})C_n^+A^-$ ⊢⊣	π_β		0.019	See Table S			
π^0	135.0				0.018				
ρ	765 ±3 Xscale=1.3	$1(1^{--})C_n^-A^+$ ⊢⊣	π_γ	124 ±4 Xscale=2.8	0.585 0.173	2π	100	486	357
						4π	<5	207	243
						πγ	<2	626	370
						e^+e^-	≈0.0065	764	382
A1 (b)	1072 ±8 Xscale=1.6	$1(1^{++})C_n^+A^-$ ⊢⊣ ⊢⊣	π	125	1.150 0.27	ρπ	≈100	167	231
						$\bar{K}K$	<5	C forbidden for odd J	
B (b)	1220	$1(\geq 1^{2+})C_n^-A^+$ ⊢ ⊢⊣	π	125 ±17 Xscale=2.2	1.488 0.31	ωπ	≈100	298	339
						ππ	<30	Permitted only for 1^-	
						$\bar{K}K$	<10	assignment, if J<3	
						4π	<50	662	528
A2	1324 ±9 Xscale=2.5	$1(2^{++})C_n^+$ ⊢⊣	π_a^{II}	90 ±10	1.753 0.24	ρπ	≈91	419	426
						$\bar{K}K$	5.5±1.5	333	439
						ηπ	3.6±3.0	636	537
						Xscale=1.3			
$K^\pm$	493.8	$1/2(0^-)A^-$ ⊢⊣	K_β		0.244	See Table S			
K^0	497.8				0.248				
κ (b)	725 ±2	$1/2(0^+)A^+$ ⊢⊣	K	<12	0.526 <0.017	Kπ	≈100	92	154
K^*	891.4 ±0.8	$1/2(1^-)A^+$ ⊢⊣	K_γ	49 ±2 Xscale=1.1	0.794 0.087	Kπ	≈100	258	288
						Kππ	<0.2	118	215
						κπ	<0.2	27	82
C (a)	1215 ±15	≤3/2( )A^- ⊢⊣ ??	K	60 ±10	1.476 0.145	Kρ	?	-44	<0
						$K^*\pi$	?	184	253
K^*	1405 ±8	$1/2(2^+)A^+$	K	95 ±11	1.988 0.27	Kπ	?	775	610

†Reported values range between <0.5 and 1%, and depend on assumptions on ρ–ω interference.
(a) It has not been shown that this entry corresponds to a state with well defined quantum numbers.
(b) It has not been shown that this entry corresponds to a state with well defined quantum numbers. See text for references suggesting alternate mechanism.

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Baryons

	Beam π and K (MeV) and (MeV/c)	$I(J^P)$ ⊢⊣=estab.	Symbol	Mass (MeV)	Γ (MeV)	$Mass^2$ and $\Gamma/(M^2)$ $(BeV)^2$	Important decays: Partial mode	Fraction (%)	Q (MeV)	p or p_{max} (MeV/c)
N	p See Table S	1/2(1/2+) ⊢⊣	N_α	938.2		0.88	See Table S			
	n			939.6		0.88				
	$N^*_{1/2}(1480)$ 550 MeV 675 MeV/c	1/2(1/2+)		Existence not yet definitely established						
	$N^*_{1/2}(1518)$ 610 MeV 737 MeV/c	1/2(3/2−) ⊢⊣	N_γ	1518 ±10	120	2.30 0.37	πN	75	440	454
							Nππ		301	408
	$N^*_{1/2}(1688)$ 900 MeV 1030 MeV/c	1/2(5/2+) ⊢⊣	N_α^{II}	1688	100	2.85 0.34	πN	≈85	610	572
							Nππ		471	538
							ηN	< 2	201	389
							ΛK		75	231
	$N^*_{1/2}(2190)$ 1935 MeV 2070 MeV/c	1/2(7/2−) ⊢⊣ ??	N_γ^{II} (?)	2190	≈200	4.80 0.88	πN	≈40	1112	888
							ΛK	seen	577	710
	$N^*_{1/2}(2650)$ 3113 MeV 3250 MeV/c	1/2(9/2+) ⊢⊣ ??	N_α^{III}	2645 ±10	≈200	7.00 1.06	πN		1567	1151
							ηN		1158	1090
Δ	$N^*_{3/2}(1236)$ 196 MeV 305 MeV/c	3/2(3/2+) ⊢⊣	Δ_δ	1236.0 ±0.4	120.0 ±1.5	1.53 0.30	πN	100	160	233
	$N^*_{3/2}(1924)$ 1354 MeV 1488 MeV/c	3/2(7/2+) ⊢⊣	Δ_δ^{II}	1924	≈200	3.70 0.65	πN	60	846	725
							ΣK		241	435
	$N^*_{3/2}(2360)$ 2349 MeV 2485 MeV/c	3/2(9/2−) ⊢⊣ ??	Δ_β^{III} (?)	2360	~200	5.58 0.95	πN	≈15	1282	988
	$N^*_{3/2}(2825)$ 3633 MeV 3770 MeV/c	3/2(11/2+) ⊢⊣ ??	Δ_δ^{III}	2825	260	7.98 1.47	πN		1747	1252
Λ	Λ See Table S	0(1/2+) ⊢⊣	Λ_α	1115.4		1.24	See Table S			
	$Y^*_0(1405)$ < 0 Kp	0(1/2−) ⊢⊣	Λ_β	1405	35±5	1.97 0.10	Σπ	100	76	151
							Λππ	< 1	10	69
	$Y^*_0(1520)$ 137 MeV 393 MeV/c	0(3/2−) ⊢⊣	Λ_γ	1518.9 ±1.5	16 ±2	2.31 0.05	Σπ	55±7	190	266
							$\bar{K}N$	29±4	87	243
							Λππ	16±2	124	251
	$Y^*_0(1815)$ 662 MeV 1045 MeV/c	0(5/2+) ⊢⊣	Λ_α^{II}	1815 ±5	50	3.29 0.18	$\bar{K}N$	≈ 75	378	538
							Σπ	≈ 9	486	504
					[mainly $Y_1^*(1385)+\pi$] ←		Λππ	≈ 15	420	515
							Λη	≈ 1	151	344
Σ	Σ See Table S	1(1/2+) ⊢⊣	Σ_α	(+) 1189.5 (0) 1192.6 (-) 1197.4		1.41 1.42 1.43	See Table S			
	$Y^*_1(1385)$ < 0 Kp	1(3/2+) ⊢⊣	Σ_δ	1382.7 ±.5 Xscale=1.5	44 ±2 Xscale=2.8	1.91 0.12	Λπ	90±2	127	205
							Σπ	10±2	55	124
								Xscale=1.4		
	$Y^*_1(1660)$ 374 MeV 715 MeV/c	1(≥3/2) ⊢	$\Sigma\beta$	1660 ±10	44 ±5	2.76 0.15	$\bar{K}N$	≈ 15	223	400
							Σπ	≈ 30	328	383
							Λπ	≈ 5	405	439
					[mainly $Y_0^*(1405)+\pi$] ←		Σππ	≈ 30	188	321
							Λππ	≈ 20	265	389
	$Y^*_1(1765)$ 561 MeV 932 MeV/c	1(5/2−) ⊢⊣	Σ_β	1762 ±17	75 ±7 Xscale=2.1	3.11 0.26	$\bar{K}N$	≈ 60	328	496
							Λπ	≈ 16	510	517
							Σπ	≤ 3	436	467
							$Y_1^*(1385)+\pi$	≈ 10	243	318
							$Y_0^*(1520)+\pi$	≈ 10	107	188
	$Y^*_1(2065)$ 1180 MeV 1600 MeV/c	1(7/2+) ⊢⊣	Σ_δ^{II}	2065	≈160	4.26 0.74	$\bar{K}N$	~.35	632	728
							Λπ		819	726
Ξ	Ξ See Table S	1/2(1/2+) ⊢⊣	Ξ_α	(-) 1321 (0) 1314		1.75 1.73	See Table S			
	$\Xi^*(1530)$	1/2(3/2+) ⊢⊣ p wave	Ξ_δ	(-) 1529.7 ±0.9 Xscale = 1.1	7.5 ±1.7	2.34 0.02	Ξπ	≈ 100	73	148
	$\Xi^*(1816)$	1/2(3/2−) ⊢⊣	Ξ_γ	1816 ±3	16 ±4 Xscale=2.2	3.29 0.06	$\Xi^*\pi$	≈ 25	149	232
							ΛK	≈ 65	205	394
							Ξπ	≈ 5	362	413
							Ξππ	≈ 5	222	312
	$\Xi^*(1933)$	1/2(5/2+)	Ξ	1933 ±16	140 ±35	3.74 0.54	Ξπ		473	501
Ω	Ω⁻ See Table S	0(3/2+)	Ω_δ	1675 ±3		2.81	See Table S			

A. H. Rosenfeld, A. Barbaro-Galtieri, W. H. Barkas, P. L. Bastien, J. Kirz, and M. Roos,
UCRL-8030 - Part I, August 1965.

nine 1^- states (ρ, $K^*(890)$, ω, ϕ) are known, and the grouping of ($A2$, $K^*(1440)$, f^0, f') into a 2^+ nonet has been suggested.[11] These nonets may be considered as (octet+singlet) representations of SU(3), with possible mixing between the isosinglet member of the octet and the SU(3) singlet to form the observed particles. The Gell-Mann–Okubo formula

$$M^2_{I=0}=\tfrac{1}{3}[4M^2_{I=\frac{1}{2}}-M^2_{I=1}] \qquad (2)$$

predicts the mass of the $I=0$ member of the octets. Note that in all three cases the calculated mass falls between the masses of the two observed $I=0$ states in the nonet as is required. For 0^- mesons the predicted value (568 MeV) is close to the η mass, and does not require significant mixing between the η and the X^0. In the other two cases (928 MeV for 1^-, 1435 MeV for 2^+) the mixing is considerably stronger.

[11] L. M. Hardy *et al.*, Phys. Rev. Letters **14**, 401 (1965); R. C. Arnold, Phys. Rev. Letters **14**, 657 (1965); S. L. Glashow and R. H. Socolow, Phys. Rev. Letters **15**, 329 (1965); also, S. U. Chung *et al.*, Phys. Rev. Letters **15**, 325 (1965); and V. E. Barnes *et al.*, Phys. Rev. Letters **15**, 322 (1965).

[r] Recent revisions and comments may be found in the review papers by A. H. Rosenfeld and by Ch. Peyrou in the *Proceedings of the 1965 Oxford Conference on High Energy Physics* (to be published January 1966).

DATA FOR TABLES ON STABLE PARTICLES

STABLE MEANING IMMUNE TO STRONG DECAY

```
•     END TAPE

CODE EVENT QUANTITY  ERROR+    ERROR-    REFERENCE  YR TECH SIGN
    IN PEAK

    • INDICATES DATA IGNORED BY PROGRAMS
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ν_e

```
                    1  E-NEUTRINO  (0,J=1/2)

                    1  E-NEUTRINO  MASS (KEV)

S 1M •    LESS THAN              0.25     LANGER      52 CNTR
S 1M •    LESS THAN              0.15     HAMILTON    53 CNTR
S 1M •    LESS THAN     0.55 +OR- 0.28     FRIEDMAN    58 CNTR
```

ν_μ

```
                    2  MU-NEUTRINO  (0,J=1/2)

                    2  MU-NEUTRINO  MASS (MEV)

S 2M •    LESS THAN              3.5      BARKAS      56 EMUL
S 2M •    LESS THAN              4.0      DUDZIAK     59 CNTR
S 2M •    LESS THAN              2.5      BARDON      65 SPRK
S 2M •    LESS THAN              2.8      SHAFER      65 CNTR
```

e

```
                    3  ELECTRON  (0.5,J=1/2)

                    3  ELECTRON  MASS (MEV)

S 3M       0.511006  0.000002            COHEN       63 RVUE

                    3  ELECTRON MAGNETIC MOMENTIE/2ME)

S 3MM      1.0011609 0.0000024           SCHUPP      61 CNTR
```

μ

```
                    4  MUON  (106,J=1/2)

                    4  MUON  MASS (MEV)

S 4M       105.659   0.002               FEINBERG    63 RVUE

                    4  MUON LIFETIME (UNITS 10**-6)

S 4T         2.200   0.015     0.015     FISHER      59 CNTR
S 4T         2.211   0.003     0.003     REITER      60 CNTR
S 4T         2.225   0.006     0.006     ASTBURY     60 CNTR
S 4T         2.208   0.004     0.004     TELEGDI     60 CNTR
S 4T         2.203   0.004     0.004     LUNDY       62 CNTR

S 4T         2.198   0.001     0.001     FARLEY      62 CNTR
S 4T         2.202   0.003     0.003     ECKHAUSE    62 CNTR
S 4T         2.197   0.002     0.002     MEYER       63 CNTR

                    4  MUON PARTIAL DECAY MODES

S 4P1     MUON INTO E (E-NEU) (MU-NEU)                        S 3S 1S 2
S 4P2     MUON INTO E 2GAMMA                                  S 3S 0S 0
S 4P3     MUON INTO 3ELECTRONS                                S 3S 3S 3
S 4P4     MUON INTO E GAMMA                                   S 3S 0

                    4  MUON  BRANCHING RATIOS

S 4R1•    MUON INTO  E+2GAMMA  (IN UNITS OF 10**-5)          (P2)/(P1)
S 4R1•    LESS THAN              1.6      FRANKEL 1   63 SPRK

S 4R2•    MUON INTO 3E (IN UNITS OF 10**-7)                  (P3)/(P1)
S 4R2•    LESS THAN              5.0      PARKER 1    62 CNTR
S 4R2•    LESS THAN              1.3      ALIKHANOV   62 SPRK
S 4R2•    LESS THAN              1.5      FRANKEL 2   63 CNTR
S 4R2•    LESS THAN              1.45     BABAEV      63 SPRK

S 4R3•    MUON INTO  E+GAMMA  (IN UNITS OF 10**-8)           (P4)/(P1)
S 4R3•    LESS THAN              1.2      FRANKEL 1   63 SPRK
S 4R3•    LESS THAN              0.6      PARKER 2    64 SPRK

                    4  MUON  MAGNETIC MOMENT (IN E/(2•MUON MASS)

S 4MM      1.001162  0.000005            CHARPAK     62 CNTR
```

$\pi^\pm$

```
                    8  CHARGED PION  (140,JPG=0--)  I=1

                    8  CHARGED PI  MASS (MEV)

S 8M •     139.37    0.14                CROWE       54 CNTR  -
S 8M •     139.68    0.15                BARKAS      56 EMUL  +
S 8M       139.580   0.015               SHAFER      65 CNTR

                    8  PI+ MU+ MASS DIFFERENCE (MEV)

S 8D        34.00    0.076               BARKAS      56 EMUL
S 8D        33.89    0.076               BARKAS      56 EMUL


                    8  CHAR.PI LIFETIME (UNITS 10**-9)

S 8T        25.6     0.5       0.5       CROWE       57 RVUE
S 8T 8000   25.46    0.32      0.32      ASHKIN      60 CNTR
S 8T        25.6     0.8       0.8       ANDERSON    60 CNTR
S 8T •                                   MERRISON    62 RVUE

                    8  CHARGED PION PARTIAL DECAY MODES

S 8P1     CHAR.PION INTO MU (MU-NEU)                          S 4S 2
S 8P2     CHAR.PION INTO E (E-NEU)                            S 3S 1
S 8P3     CHAR.PION INTO MU (MU-NEU) GAMMA                    S 4S 2S 0
S 8P4     CHAR.PION INTO PIO E (E-NEU)                        S 9S 3S 1

                    8  CHARGED PION BRANCHING RATIOS

S 8R1•    CHAR.PION INTO MU NEU GAMMA  (UNITS 10**-4)        (P3)/(P1)
S 8R1  26    1.24       0.25              CASTAGNOLI  58 EMUL

S 8R2•    CHAR.PION INTO E NEU         (UNITS 10**-4)        (P2)/(P1)
S 8R2        1.21       0.07              ANDERSON    60 CNTR
S 8R2        1.247      0.028             DI CAPUA    64 CNTR

S 8R3•    CHAR.PION INTO PIO E NEU     (UNITS 10**-8)        (P4)/(P1)
S 8R3• 10    2.0        0.6               BACASTOW    62 CNTR
S 8R3  52    1.17       0.12              DEPOMMIER   64 CNTR
S 8R3  43    1.1        0.2               DUNAITSEV   64 CNTR
S 8R3  36    0.97       0.20              BARTLETT    64 SPRK
S 8R3  38    1.07       0.21              BACASTOW    65 SPRK +
```

π^0

```
                    9  NEUTRAL PION  (135,JPG=0--)  I=1

                    9  PI MASS DIFFERENCE (PI+-)-(PI0)(MEV)

S 9D        5.37       1.0               PANOFSKY    51 CNTR  -
S 9D        4.50       0.31              CHINOWSKY   54 CNTR  -
S 9D        4.62       0.05              HADDOCK     59 CNTR  -
S 9D        4.60       0.04              HILLMAN     59 CNTR
S 9D        4.55       0.07              CASSELS     59 CNTR

S 9D        4.6056     0.0055            CZIRR       63 CNTR
S 9D        4.59       0.03              PETRUKHIN   63 CNTR  -

                    9  PIO  LIFETIME (UNITS 10**-16)

S 9T   76   1.9        0.5       0.5     GLASSER     61 EMUL
S 9T   45   2.3        1.1       1.0     TIETGE      62 EMUL
S 9T   88   2.8        0.9       0.9     KOLLER      63 EMUL
S 9T        1.05       0.18      0.18    VON DARDEL  63 CNTR

S 9T   47   1.25       0.57      0.45    EVANS       63 EMUL
S 9T   75   1.7        0.5               SHWE        64 EMUL

                    9  NEUTRAL PION PARTIAL DECAY MODES

S 9P1     PIO INTO 2GAMMA                                     S 0S 0
S 9P2     PIO INTO E+ E- GAMMA                                S 3S 3S 0
S 9P3     PIO INTO 4ELECTRONS                                 S 3S 3S 3S 3

                    9  NEUTRAL PION BRANCHING RATIOS

S 9R1•    PIO INTO (GAMMA E+ E-)/(2GAMMA)                    (P2)/(P1)
S 9R1        0.01187   0.00048           SAMIOS      61 HBC
S 9R1•    USING  PANOFSKY RATIO = 1.54
S 9R1  27    0.0117    0.0015            BUDAGOV     60 HBC
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REFERENCES FOR TABLES ON STABLE PARTICLES

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IDENTIFIC.  YR AUTHORS                          JOUR.VOL PAGE YR INSTITUTION     CDD
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ν_e

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                    1  E-NEUTRINO  (0,J=1/2)

LANGER      52 CNTR L M LANGER , RJD MUFFAT PR    88  689 52 INDIANA          S 1
HAMILTON    53 CNTR D R HAMILTON +          PR    92 1521 53 PRINCETON       S 1
FRIEDMAN    58 CNTR L FRIEDMAN , L G SMITH  PR   109 2214 58 B N L           S 1
```

ν_μ

```
                    2  MU-NEUTRINO  (0,J=1/2)

BARKAS      56 EMUL W H BARKAS +            PR   101  778 56 L R L           S 2
DUDZIAK     59 CNTR W DUDZIAK +             PR   114  336 59 L R L           S 2
BARDON      65 SPRK BARDON,NORTON,PEOPLES + PRL  14  449 65 COLUMBIA         S 2
SHAFER      65 CNTR SHAFER,CROWE,JENKINS    PRL  14  923 65 L R L           S 2
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e

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                    3  ELECTRON  (0.5,J=1/2)

SCHUPP      61 CNTR SCHUPP,PIDD,CRANE       PR   121    1 61 MICHIGAN        S 3
COHEN       63 RVUE E R COHEN ,JWM DUMOND   REPORT IUPAP  63 RVUE            S 3
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μ

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                    4  MUON  (106,J=1/2)

FISHER      59 CNTR J FISHER +              PRL    3  349 59 CERN            S 4
ASTBURY     60 CNTR A ASTBURY +             ROCH  60  542 60 LIVERPOOL       S 4
DEVONS      60 XRAY S DEVONS +              PRL    5  330 60 COLUMBIA         S 4
LATHROP     60 XRAY J LATHROP +             NC    17  109 60 CHICAGO          S 4
LATHROP     60 XRAY J LATHROP +             NC    17  114 60 CHICAGO          S 4
REITER      60 CNTR R A REITER +            PRL-   5   22 60 CARNEGIE        S 4
TELEGDI     60 CNTR V L TELEGDI             ROCH  60  713 60 CHICAGO          S 4

CHARPAK     61 CNTR G CHARPAK +             PRL    6  128 61 CERN            S 4
HUTCHINSON  61 CNTR D P HUTCHINSON +        PRL    7  129 61 COLUMBIA        S 4

ALIKHANOV   62 SPRK A I ALIKHANOV +         CERN       423 62 ITEP           S 4
CHARPAK     62 CNTR G CHARPAK +             PL     1   16 62 CERN            S 4
FARLEY      62 CNTR F J M FARLEY +          CERN  62  415 62 CERN            S 4
LUNDY       62 CNTR R A LUNDY               PR   125 1686 62 CHICAGO         S 4
PARKER 1    62 CNTR S PARKER, S PENMAN      NC    23  485 62 EFINS           S 4
SHAPIRO     62 RVUE G SHAPIRO +             PR   125 1022 62 COLUMBIA        S 4

BABAEV      63 SPKK A I BABAEV +            JETP  16 1397 63 ITEP           S 4
ECKHAUSE    63 CNTR M ECKHAUSE              PR   132  422 63 CARNEGIE        S 4
FEINBERG    63 RVUE G FEINBERG, LM LEDERMAN ANNS  13  431 63 RVUE            S 4
FRANKEL 1   63 SPRK S FRANKEL +            NC    27  894 63 PEN + LRL        S 4
FRANKEL 2   63 CNTR S FRANKEL +            PR   130  351 63 PEN + LRL        S 4
MEYER       63 CNTR S L MEYER +             PR   132 2693 63 COLUMBIA        S 4
PARKER 2    64 SPRK PARKER,ANDERSON,RAY     PR   133 B768 64 EFINS           S 4
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$\pi^\pm$

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                    8  CHARGED PION  (140,JPG=0--)  I=1

CROWE       54 CNTR K M CROWE,RH PHILLIPS   PR    96  470 54 L R L           S 8
BARKAS      56 EMUL BARKAS,BIRNBAUM,SMITH   PR   101  778 56 L R L           S 8
CROWE       57 RVUE K M CROWE               NC     5  541 57 STANFORD        S 8
CASTAGNOLI  58 EMUL C CASTAGNOLI,M MUCHNICH PR   112 1779 58 ROME            S 8

ANDERSON    60 CNTR H L ANDERSON +          PR   119 2050 60 EFINS           S 8
ASHKIN      60 CNTR J ASHKIN +              NC    16  490 60 CERN            S 8
BACASTOW    62 CNTR R BACASTOW +            PRL    9  400 62 L R L           S 8
MERRISON    62 RVUE A W MERRISON            ADVP  11    1 62 LIVERPOOL      S 8
SHAPIRO     62 RVUE G SHAPIRO +             PR   125 1022 62 COLUMBIA        S 8

CZIRR       63 CNTR J B CZIRR               PR   130  341 63 L R L           S 8
DUNAITSEV   63 CNTR A F DUNAITSEV +         BNL        344 63 JINR           S 8

BARTLETT    64 SPRK BARTLETT,DEVONS,MEYER+  PR   13681452 64 COLUMBIA      S 8
DEPOMMIER   64 CNTR DEPOMMIER +             DUBNA      64 CERN              S 8
DI CAPUA    64 CNTR E DI CAPUA +            PR   13381333 64 COLUMBIA       S 8
DUNAITSEV   64 CNTR DUNAITSEV,PETRUKHIN +   TO BE PUBL.  64 JINR           S 8
BACASTOW    65 SPRK BACASTOW,GHESQUIERE +   PHEPR INITISLAC165 LRL+SLAC     S 8
CLINE       65 PBC  CLINE,FRY               PRL    15  293 65 WISCONSIN     S 8
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π^0

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                    9  NEUTRAL PION  (135,JPG=0--)  I=1

PANOFSKY    51 CNTR PANOFSKY,AAMODT,HADLEY  PR    81  565 51 L R L           S 9
CASSELS     59 CNTR J M CASSELS +           PPS   74   92 59                 S 9
CHINOWSKY   54 CNTR W CHINOWSKY,STEINBERGER PR    93  586 54 COLUMBIA        S 9
HADDOCK     59 CNTR R P HADDOCK             PRL    3  478 59 L R L           S 9
HILLMANN    59 CNTR P HILLMAN +             NC    14  887 59                 S 9

BUGADOV     60 HBC  YU BUGADOV, WIKTOR      JETP  11  755 60 JINR            S 9
GLASSER     61 EMUL R G GLASSER +           PR   123 1014 61 NAVAL RES       S 9
SAMIOS      61 HBC  N P SAMIOS              PR   121  275 61 COLUMBIA+BNL     S 9
TIETGE      62 EMUL J TIETGE +              PR   127 1324 62 M PLANCK         S 9

CZIRR       63 CNTR J B CZIRR               PR   130  341 63 L R L           S 9
EVANS       63 EMUL D EVANS, J MULVEY       SIENA      477 63 OXFORD         S 9
KOLLER      63 EMUL E L KOLLER +            NC    27 1405 63 STEVENS         S 9
PETRUKHIN   63 CNTR VI PETRUKHIN,PROKOSHKIN SIENA     208 63 DUBNA           S 9
VON DARDEL  63 CNTR G VON DARDEL +          PL     4   51 63 CERN            S 9
SHWE        64 EMUL SHWE,SMITH,BARKAS       PR   136 B1839 64 L R L         S 9
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DATA FOR TABLES ON STABLE PARTICLES Cont'd.

STABLE MEANING IMMUNE TO STRONG DECAY

CODE EVENT QUANTITY ERROR+ ERROR- REFERENCE YR TECH SIGN
IN PEAK

* INDICATES DATA IGNORED BY PROGRAMS

$K^{\pm}$

10 CHARGED K (494,JP=0-) I=1/2

10 CHARGED K MASS (MEV)

S10M	493.9	0.2		COHEN	57	RVUE +
S10M	493.7	0.3		BARKAS	63	EMUL -

10 CHAR.K LIFETIME (UNITS 10**-8)

S10T	0.95	0.36	0.25	ILOFF	56	EMUL
S10T	1.211	0.026	0.026	FITCH	57	CNTR
S10T	1.227	0.015	0.015	ALVAREZ	57	CNTR
S10T 52	1.60	0.3	0.3	EISENBERG	58	EMUL
S10T	1.21	0.06	0.06	BURROWES	59	CNTR
S10T 33	1.38	0.24	0.24	FREDEN	60	EMUL
S10T 51	1.27	0.36	0.23	BHOWMIK	61	EMUL
S10T 293	1.31	0.08	0.08	NORDIN	61	H BC
S10T	1.25	0.22	0.17	BARKAS	61	EMUL
S10T	1.231	0.011	0.011	BOYARSKY	62	CNTR

10 CHARGED K PARTIAL DECAY MODES

S10P1	CHAR. K INTO MU (NEU)	K MU 2	S 4S 2
S10P2	CHAR. K INTO PI PIO	K PI 2	S 8S 9
S10P3	CHAR. K INTO PI PI+ PI-	TAU	S 8S 8S 8
S10P4	CHAR. K INTO PI 2PIO	TAU PRIME	S 8S 9S 9
S10P5	CHAR. K INTO MU PIO NEU	K MU 3	S 4S 9S 2
S10P6	CHAR. K INTO E PIO NEU	K E 3	S 3S 9S 1
S10P7	POSIT.K INTO PI+ PI- E+NEU	K E+ 4	S 8S 8S 3S 1
S10P8	POSIT.K INTO PI+ PI+ E-NEU	K E- 4	S 8S 8S 3S 1
S10P9	CHAR. K INTO PI PIO GAMMA		S 8S 9S 0
S10P1 0	CHAR. K INTO PI E+ E-		S 8S 3 S 3
S10P1 1	CHAR. K INTO PI PI MU NEU	K MU+ 4	S 8S 8S 4S 2
S10P1 2	CHAR. K INTO E NEU	KE2	S 3S 1
S10P1 3	CHAR. K INTO PI MU+ MU-		S 8S 4S 4
S10P1 4	CHAR. K INTO PI PI+ PI- GAMMA		S 8S 8S 8S 0

10 CHARGED K BRANCHING RATIOS

S10R1*	CHAR. K INTO MU NEU (MU2)	(UNITS 10**-2)		(P1)/TOTAL
S10R1	58.5	3.0	BIRGE	56 EMUL +
S10R1	56.9	2.6	ALEXANDER	57 EMUL +
S10R1	64.2	1.3	ROE	61 XBC +
S10R1	63.0	0.8	SHAKLEE	64 XBC +
S10R2*	CHAR. K INTO PI PIO (PI2)	(UNITS 10**-2)		(P2)/TOTAL
S10R2	27.7	2.7	BIRGE	56 EMUL +
S10R2	23.2	2.2	ALEXANDER	57 EMUL +
S10R2	18.6	0.9	ROE	61 XBC +
S10R2	22.4	0.8	SHAKLEE	64 XBC +
S10R2	21.0	0.6	CALLAHAN	65 PBC
S10R3*	CHAR. K INTO PI PI+ PI-(TAU)	(UNITS 10**-2)		(P3)/TOTAL
S10R3	5.6	0.4	BIRGE	56 EMUL +
S10R3	6.0	0.4	ALEXANDER	57 EMUL +
S10R3	5.2	0.3	TAYLOR	59 EMUL +
S10R3	5.7	0.3	ROE	61 XBC +
S10R3	5.1	0.2	SHAKLEE	64 XBC +
S10R3 2332	5.54	0.12	CALLAHAN	64 XBC +
S10R4*	CHAR. K INTO PI 2PIO (TAU PRIME)	(UNITS 10**-2)		(P4)/TOTAL
S10R4	2.1	0.5	BIRGE	56 EMUL +
S10R4	2.2	0.4	ALEXANDER	57 EMUL +
S10R4	1.5	0.2	TAYLOR	59 EMUL +
S10R4	1.7	0.2	ROE	61 XBC +
S10R4	1.8	0.2	SHAKLEE	64 XBC +
S10R5*	CHAR. K INTO MU PIO NEU (MU3)	(UNITS 10**-2)		(P5)/TOTAL
S10R5	2.8	1.0	BIRGE	56 EMUL +
S10R5	3.9	1.3	ALEXANDER	57 EMUL +
S10R5	2.8	0.4	TAYLOR	59 EMUL +
S10R5	4.8	0.6	ROE	61 XBC +
S10R5	3.0	0.5	SHAKLEE	64 XBC +
S10R6*	CHAR. K INTO E PIO NEU (E3)	(UNITS 10**-2)		(P6)/TOTAL
S10R6	5.1	1.3	ALEXANDER	57 EMUL +
S10R6	3.2	1.3	BIRGE	56 EMUL +
S10R6	5.0	0.5	ROE	61 XBC +
S10R6	4.7	0.3	SHAKLEE	64 XBC +
S10R7*	POSIT.K INTO PI+ PI- E+ NEU	(UNITS 10**-5)		(P7)/TOTAL
S10R7 75	4.3	0.9	BIRGE	64 FBC +
S10R8*	POSIT.K INTO PI+ PI+ E- NEU	(UNITS 10**-5)		(P8)/TOTAL
S10R8* 0	0.1 OR LESS		BIRGE	64 FBC +
S10R9*	CHAR. K INTO (MU PIO NEU)/(PI PI+ PI-)			(P5)/(P3)
S10R9 1220	0.61	0.05	BISI	64 PBC
S10R1*0	CHAR. K INTO PI PIO GAMMA	(UNITS 10**-4)		(P9)/TOTAL
S10R1*0 18	2.2	0.7	CLINE	64 FBC +
S10R1*0	PREVIOUS RESULT FOR PI+ KIN.EN. (55-90) MEV			
S10R1*1	POS.K INTO(PI+ PI- MU+ NEU)/TAU (UNITS 10**-3)			(P11)/(P3)
S10R1*1 1	0.25 APPROX		GREINER	64 EMUL +
S10R1*2	CHAR. K INTO (PI E+ E-)/TOTAL (UN 10**-6)			(P10)/TOTAL
S10R1*2 1	1.1 OR LESS		CAMERINI	64 FBC +
S10R1*3	POS. K INTO (E PIO NEU)/(PI+ PI+ PI-)			(P6)/(P3)
S10R1*3230	0.90	0.06	BORREANI	64 HBC +
S10R1*4	CHA.K INTO E NEU(E2)	(UNITS 10**-3)		(P12)/TOTAL
S10R1*4	1.6 OR LESS		BORREANI	64 HBC +
S10R1*5	CHAR. K INTO(PI MU+ MU-)/TOTAL (UN 10**-6)			(P13)/TOTAL
S10R1*5	3.0 OR LESS		CAMERINI	65 PBC +
S10R1*6	POSI. K INTO (PI+PI-MU+NEU)/TOTAL (UN 10**-5)			(P11)/TOTAL
S10R1*6 1	1.2 OR LESS		CLINE	65 PBC +
S10R1*7	CHAR. K INTO TAU PRIME/TAU			(P4)/(P3)
S10R1 7	0.303	0.009	BISI	65 HBC +
S10R1*8	CHAR. K INTO(PI PI+ PI- GAM)/TAU (UN 10**-3)			(P14)/(P3)
S10R1 8 7	1.7	0.7	STAMER	65 EMUL +
S10R1*8	PREVIOUS RESULT FOR GAM ENE. LESS THAN 1.1 MEV			

K^{0}

11 NEUTRAL K (JP=0-) I=1/2

11 KO MASS (MEV)

S11M	498.1	0.4	CHRISTENSON64	SPRK	

11 KO-K CH. MASS DIFFERENCE (MEV)

S11D	3.9	0.6	ROSENFELD	59	HBC	-
S11D	5.4	1.1	CRAWFORD	59	HBC	+
S11D 9	3.90	0.25	BURNSTEIN	65	HBC	-

K^{0}_{1}

12 KO1 LIFETIME (UNITS 10**-10)

S12T 90	1.07	0.13	0.13	BOLDT	58 CC
S12T 62	0.81	0.23	0.15	BROWN	58 PBC
S12T 29	0.84	0.35	0.19	COOPER	58 CC
S12T 39	1.15	0.40	0.25	BLUMENFELD	58 CC
S12T 259	1.06	0.08	0.06	EISLER	58 PBC
S12T 512	0.94	0.05	0.05	CRAWFORD	59 HBC
S12T 63	1.09	0.18	0.15	BOWEN	60 CC
S12T 500	0.90	0.05	0.05	GARFINKEL	62 HBC
S12T 378	0.94	0.05	0.05	BERTANZA	62 HBC
S12T 2500	0.885	0.025	0.025	GOLDEN	62 HBC
S12T 503	0.87	0.05		CHRETIEN	63 PBC
S12T 545	0.86	0.04		KREISLER	64 SPRK
S12T 7786	0.849	0.014		FRANZINI	65 HBC

12 KO1 PARTIAL DECAY MODES

S12P1	KO1 INTO PI+ PI-	S 8S 8
S12P2	KO1 INTO PIO PIO	S 9S 9

12 KO1 BRANCHING RATIOS

S12R1*	KO1 INTO (PI+ PI-)/TOTAL				(P1)/TOTAL
S12R1	0.68	0.09	CRAWFORD	59	HBC
S12R1	0.70	0.18	COLUMBIA	60	HBC
S12R1	0.74	0.07	ANDERSON	62	HBC
S12R2*	KO1 INTO (PIO PIO)/TOTAL				(P2)/TOTAL
S12R2	0.27	0.11	CRAWFORD	59	HBC
S12R2	0.26	0.06	BAGLIN	60	PBC
S12R2	0.30	0.035	BROWN	61	XBC
S12R2 1066	0.335	0.014	BROWN	63	XBC
S12R2 198	0.288	0.021	CHRETIEN	63	PBC

REFERENCES FOR TABLES ON STABLE PARTICLES Cont'd

IDENTIFIC.	YR	AUTHORS	JOUR,VOL	PAGE	YR	INSTITUTION	COD

$K^{\pm}$

10 CHARGED K (494,JP=0-) I=1/2

BIRGE	56	EMUL R W BIRGE +	NC	4	834	56 L R L	S10
ILOFF	56	EMUL E L ILOFF +	PR	102	927	56 L R L	S10
ALEXANDER	57	EMUL G ALEXANDER +	NC	6	478	57 DUBLIN	S10
ALVAREZ	57	CNTR L W ALVAREZ +	UCRL8030		57	L R L	S10
COHEN	57	RVUE E R COHEN,CROWE,DUMOND	FUND.CONS.PHYS	557		RVUE	S10
FITCH	57	CNTR V FITCH +	UCRL8030		57	PRINCETON	S10
EISENBERG	58	EMUL Y EISENBERG +	NC	8	663	58 BERN	S10
BURROWES	59	CNTR H C BURROWES +	PRL	2	117	59 M I T	S10
FREDEN	60	EMUL S C FREDEN +	PR	118	564	60 L R L LIVERMORE	S10
TAYLOR	59	EMUL S TAYLOR +	PR	114	359	59 COLUMBIA	S10
BARKAS	61	EMUL W H BARKAS +	PR	124	1209	61 L R L	S10
BHOWMIK	61	EMUL B BHOWMIK +	NC	20	857	61 DELHI	S10
NORDIN	61	HBC P NORDIN JR	PR	123	2168	61 L R L	S10
ROE	61	XBC B P ROE +	PRL	9	346	61 MICHIGAN+LRL	S10
BOYARSKY	62	CNTR A M BOYARSKY +	PR	128	2398	62 M I T	S10
BARKAS	63	EMUL BARKAS,DYER,HECKMAN	PRL	11	26	63 L R L	S10
BIRGE	63	FBC R W BIRGE +	PRL	11	35	63 LRL+WISCON+BARI	S10
BIRGE	64	FBC R.W BIRGE +	DUBNA			64 LRL+WISCON+BARI	S10
BISI	64	PBC BISI,BORREANI,CESTER +	PRL	12	490	64 TORINO	S10
BORREANI	64	HBC BORREANI,RINAUDO +	PL	12	123	64 TORINO	S10
CALLAHAN	64	XBC A.CALLAHAN +	PR	136 B1463		64 WISCONSIN	S10
CAMERINI	64	FBC CAMERINI,CLINE,FRY +	PRL	13	318	64 WISCON.+LRL	S10
CLINE	64	FBC D CLINE,W F FRY	PRL	12	101	64 WISCONSIN	S10
GREINER	64	EMUL GREINER,OSBORNE,BARKAS	PRL	13	284	64 L R L	S10
SHAKLEE	64	XBC F.S.SHAKLEE+	PR	136 B1423		64 MICHIGAN	S10
CAMERINI	65	PBC CAMERINI,CLINE,GIDAL +	NC	37	1795	65 WISCONSIN+LRL	S10
STAMER	65	EMUL STAMER,	PR	138 B640		65 STEVENS INS.TEC.	S10
CALLAHAN	65	PBC CALLAHAN,CLINE	PRL	15	129	65 WISCONSIN	S10
BISI	65	HBC BISI,BORREANI,CESTER +	NC	35	768	65 TORINO	S10
CLINE	65	PBC CLINE,FRY	PL	15	293	65 WISCONSIN	S10

QUANTUM NUMBERS DETERMINATIONS NOT REFERRED TO IN DATA CARDS

BLOCK	62	HEBC BLOCK,LENDINARA,MONARI	CERN		371	62 NWEST+BOLOGNA	S10

K^{0}

11 NEUTRAL K (JP=0-) I=1/2

CRAWFORD	59	HBC F S CRAWFORD +	PRL	2	112	59 L R L	S11
ROSENFELD	59	HBC ROSENFELD,SOLMITZ,TRIPP	PRL	2	110	59 L R L	S11
BURNSTEIN	65	HBC BURNSTEIN,RUBIN	PR	138 B895		65 MARYLAND	S11

K^{0}_{1}

12 KO1 (JP=0-) I=1/2

BLUMENFELD	58	CC H BLUMENFELD +	CERN		272	58 COLUMBIA	S12
BOLDT	58	CC E BOLDT +	PRL	1	150	58 M I T	S12
BROWN	58	PBC J BROWN +	CERN		272	58 MICHIGAN	S12
COOPER	58	CC A COOPER +	CERN		272	58 JUNGFRAU	S12
EISLER	58	PBC F EISLER +	CERN		272	58 COLUMBIA	S12
CRAWFORD	59	HBC F S CRAWFORD +	PRL	2	266	59 L R L	S12
BAGLIN	60	PBC C BAGLIN +	NC	18	1043	60 ECOL.POLYT.	S12
BIRGE	60	PBC R W BIRGE +	ROCH	60	601	60 L R L	S12
BOWEN	60	CC T BOWEN +	PR	119	2030	60 PRINCETON	S12
COLUMBIA	60	HBC REPORTED VIA M SCHWARZ	ROCH		727	60 COLUMBIA	S12
MULLER	60	PBC F MULLER +	PRL	4	418	60 L R L	S12
BROWN	61	XBC J L BROWN +	NC	19	1155	61 LRL+MICHIGAN	S12
FITCH	61	CNTR V L FITCH +	NC	22	1160	61 PRINCETON	S12
GOOD	61	PBC R H GOOD +	PR	124	1223	61 L R L	S12
ANDERSON	62	HBC J A ANDERSON +	CERN		836	62 L R L	S12
BERTANZA	62	HBC L BERTANZA,MONETI	PREPRINT		D105	62 BROOKHAV.	S12
CRAWFORD	62	RVUE F S CRAWFORD	CERN		827	62 RVUE	S12
GARFINKEL	62	HBC A F GARFINKEL	NEVIS104			62 COLUMBIA	S12
GOLDEN	62	HBC R L GOLDEN	CERN		839	62 L R L	S12
BROWN	63	XBC J L BROWN +	PR	130	769	63 LRL+MICHIG	S12
CHRETIEN	63	PBC M CHRETIEN +	PR	131	2208	63 BRA+BRO+HAR+MIT	S12
KREISLER	64	SPRK KREISLER,OVERSETH +	PR	136 B1074		64 PRINCETON	S12
WOJCICKI	63	HBC S G WOJCICKI				63 L R L	S12
KREISLER	64	SPRK KREISLER,OVERSETH +	PR	136 B1074		64 PRINCETON	S12
FRANZINI	65	HBC FRANZINI,KIRSCH,SCHMIDT+	PREP.NEVIS	135		65 COLUMBIA+RUTGERS	S12

DATA FOR TABLES ON STABLE PARTICLES Cont'd.

STABLE MEANING IMMUNE TO STRONG DECAY

CODE EVENT QUANTITY IN PEAK ERROR+ ERROR- REFERENCE YR TECH SIGN

• INDICATES DATA IGNORED BY PROGRAMS

K^0_2

13 K02-K01 MASS DIF.(UNITS OF 1/TAU1)

S13D •	FOR SIGN OF MASS DIFF.,SEE			MEISNER	63	HBC	
S13D	1.9	0.3		FITCH	61	CNTR	
S13D	0.84	0.29	0.21	GOOD	61	PBC	
S13D	1.5	0.2		CAMERINI	62	PBC	
S13D	0.5	0.1		CHRISTENSON	63	SPRK	
S13D	0.78	0.20		AUBERTI	64	PBC	
S13D • 48	0.6	0.6		CRAWFORD	64	HBC	
S13D	0.82	0.12		FUJII	64	SPRK	
S13D	0.53	.18	.20	AUBERT	65	PBC	ASS.CP CONS.
S13D	0.26	0.36	0.26	BALDO-CEOLI	65	PBC	ASS.CP CONS.

13 K02 LIFETIME (NANOSEC)

S13T •	ASSUMED DS=DQ AND DELTA I=1/2			CRAWFORD	59	HBC
S13T 34	81.0	32.0	24.0	BARDON	58	CC
S13T 15	51.0	24.0	13.0	DARMON	62	FBC
S13T	54.0	6.0		FUJII	64	SPRK
S13T	61.0	15.0	12.0	ASTBURY	65	CC

13 K02 PARTIAL DECAY MODES

S13P1	K02 INTO 3PIO	S 9S 9S 9
S13P2	K02 INTO PI+ PI- PIO	S 8S 8S 9
S13P3	K02 INTO PI MU NEUTRINO	S 8S 4S 2
S13P4	K02 INTO PI E NEUTRINO	S 8S 3S 1
S13P5	K02 INTO PI+ PI-	S 8S 8
S13P6	K02 INTO MU+ MU-	S 4S 4

13 K02 DECAY RATES

S13W1•	K02 INTO PIO PIO PIO		(UN. 10**6 SEC-1)				(P1)
S13W1 22	5.1	1.2		BRISSON	64	FBC	
S13W2•	K02 INTO PI+ PI- PO		(UN. 10**6 SEC-1)				(P2)
S13W2 38	2.61	0.57		BEHR	64	FBC	
S13W2 18	3.26	0.77		ANDERSON	65	HBC	
S13W3•	K02 INTO PI E NEUTRINO		(UN. 10**6 SEC-1)				(P4)
S13W3	8.15	1.0		AUBERT	65	PBC	
S13W4•	K02 INTO CHARGED (THREE-BODY)		(UN. 10**6 SEC-1)				(P2+P3+P4)
S13W4 107	15.8	1.9		AUERBACH	65	SPRK	
S13W5•	K02 INTO LEPTONIC (KMU3+KE3)		(UN 10**6 SEC-1)				(P3+P4)
S13W5 109	9.85	1.15	1.05	FRANZINI	65	HBC	

13 K02 BRANCHING RATIOS

S13R1•	K02 INTO (PIO PIO PIO)/CHARGED						(P1)/(P2+P3+P4)
S13R1	0.38	0.07		ANIKINA	62	CC	
S13R2•	K02 INTO (PI+ PI- PIO)/CHARGED						(P2)/(P2+P3+P4)
S13R2 320	0.185	.0.038	0.034	ASTIER	61	CC	
S13R2 479	0.157	.0.03		LUERS	64	HBC	
S13R2	.15	.03		ASTBURY	65	CC	
S13R3•	K02 INTO (PI MU NEUTRINO)/CHARGED						(P3)/(P2+P3+P4)
S13R3 479	0.356	0.07		LUERS	64	HBC	
S13R3	.38	.08		ASTBURY	65	CC	
S13R4•	K02 INTO (PI E NEUTRINO)/CHARGED						(P4)/(P2+P3+P4)
S13R4 479	0.487	0.05		LUERS	64	HBC	
S13R4	.46	.08	.10	ASTBURY	65	CC	
S13R5•	K02 INTO (PI E NEU)/((PI E NEU)+(PI MU NEU))						(P4)/(P3+P4)
S13R5 320	0.415	0.120		ASTIER	61	CC	
S13R6•	K02 INTO(PI+ PI- PIO)/TOTAL						(P2)/TOTAL
S13R6 16	0.18	0.05		STERN	64	HBC	
S13R6 79	0.151	0.020		ADAIR	64	HBC	
S13R7•	K02 INTO(LEPTON PI NEUTRINO)/TOTAL						(P3+P4)/TOTAL
S13R7 14	0.58	0.17		ALEXANDER	62	HBC	
S13R9•	K02 INTO (PI+ PI-)/CHARGED		(UNIT 10**-3)				(P5)/(P2+P3+P4)
S13R9• 0	10.0	OR LESS		NEAGU	61	CC	
S13R9• 0	15.0	OR LESS		LUERS	64	HBC	
S13R9• 11	2.5	OR LESS		ABASHIAN	64	SPRK	
S13R9 45	2.0	0.4		CHRISTENSON	64	SPRK	
S13R9 54	2.08	0.35		GALBRAITH	65	SPRK	
S13R9 37	3.5	1.4		DE BOUARD	65	CNTR	
S13R10	K02 INTO (PI MU NEU)/(PI E NEU)						(P3)/(P4)
S13R1 0	0.78	0.15		DE BOUARD	65	CNTR	
S13R1•1	K02 INTO (MU+MU-)/CHARGED		(UN. 10**-4)				(P6)/(P2+P3+P4)
S13R1•1 0	2.0	OR LESS		DE BOUARD	65	CNTR	

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14 ETA (549,JPG=0-+) I=0

14 ETA MASS (MEV)

S14M 53	549.0	1.2		BASTIEN	62	HBC
S14M 35	546.0	4.0		PICKUP	62	HBC
S14M 91	548.0	1.0		ALFF	62	HBC
S14M	549.3	2.9		DELCOURT	63	CNTR
S14M 148	549.0	0.7		FOELSCHE	64	HBC
S14M 325	552.0	3.0		KRAEMER	64	DBC

14 ETA WIDTH (MEV)

S14W • 53	12 OR LESS		BASTIEN	62	HBC
S14W • 91	10 OR LESS		ALFF	62	HBC
S14W •325	16.0	OR LESS	KRAEMER	64	DBC
S14W •148	10 OR LESS		FOELSCHE	64	HBC

14 ETA PARTIAL DECAY MODES

S14P1	ETA INTO 2GAMMA	S 0S 0
S14P2	ETA INTO 3PIO AND PIO 2 GAMMA, CALLED 3PIO	S 9S 9S 9
S14P3	ETA INTO PI+ PI- PIO	S 8S 8S 9
S14P4	ETA INTO PI+ PI- GAMMA	S 8S 8S 0
S14P5	ETA INTO E+E-PIO	S 9S 3S 3

14 ETA BRANCHING RATIOS

S14R1•	ETA INTO NEUTRAL/CHARGED						(P1+P2)/(P3+P4)
S14R1 10	2.5	1.0		PICKUP	62	HBC	
S14R1 53	3.20	1.26		BASTIEN	62	HBC	
S14R1 91	2.5	0.5		ALFF	62	HBC	
S14R1	2.7	0.8		SHAFER	62	HBC	
S14R1 280	3.6	0.8		KRAEMER	64	DBC	
S14R1 57	2.2	0.35		PAULI	64	DBC	
S14R2•	ETA INTO 2GAMMA/CHARGED						(P1)/(P3+P4)
S14R2	0.99	0.48		CRAWFORD	63	HBC	
S14R3•	ETA INTO 3PIO/CHARGED						(P2)/(P3+P4)
S14R3	0.66	0.25		CRAWFORD	63	HBC	
S14R4•	ETA INTO (PI+ PI- GAMMA)/(PI+ PI- PIO)						(P4)/(P3)
S14R4	0.26	0.08		FOWLER	63	HBC	
S14R4	0.14	0.08		FOELSCHE	64	HBC	
S14R4 24	0.73	0.25		PAULI	64	DBC	
S14R5•	ETA INTO 3PIO/(PI+ PI- PIO)						(P2)/(P3)
S14R5	2.0	1.0		FOELSCHE	64	HBC	
S14R5	0.90	0.24		FOSTER	65	HBC	
S14R6•	ETA INTO 2GAMMA/3PIO						(P1)/(P2)
S14R6•	1.1	0.3 OR LESS		CHRETIEN	62	PBC	
S14R6	0.80	0.25		BACCI	63	CNTR	
S14R6	1.10	0.5		MULLER	63	DBC	
S14R6 24	3.7	0.9		BAZIN	64	HBC	
S14R7•	ETA INTO 2GAMMA/(PI+ PI- PO)						(P1)/(P3)
S14R7	1.61	0.39		FOSTER	64	HBC	
S14R8•	ETA INTO NEUTRAL/(PI+ PI- PIO)						(P1+P2)/(P3)
S14R8 280	3.6	0.8		KRAEMER	64	DBC	
S14R9•	ETA INTO (E+E-PIO)/(PI+PI-PIO)		(UN 10**-2)				(P5)/(P3)
S14R9• 0	0.77	OR LESS		FOSTER	65	HBC	
S14R9•	LESS THAN	1.1	1.1	PRICE	65	HBC	

REFERENCES FOR TABLE ON STABLE PARTICLES Cont'd.

IDENTIFIC.	YR	AUTHORS	JOUR.VOL	PAGE	YR	INSTITUTION	COD

K^0_2

13 K02 (JP=0-) I=1/2

BARDON	58	CC	M BARDON ET AL	ANP	5	156	58	COLUMBIA	S13
CRAWFORD	59	HBC	F S CRAWFORD +	PRL	2	361	59	L R L	S13
ASTIER	61	CC	A ASTIER +	AIX	1	227	61	ECOLE POLYT.	S13
FITCH	61	CNTR	V L FITCH,PIRDUE,PERKINS	NC	22	1140	61	PRINC+LOSALA.	S13
GOOD	61	PBC	R H GOOD +	PR	124	1223	61	L R L	S13
NEAGU	61	CC	D NEAGU +	PRL	6	552	61	JINR (MOSCOW)	S13
ALEXANDER	62	HBC	G ALEXANDER +	PRL	9	69	62	L R L	S13
ANIKINA	62	CC	M H ANIKINA +	CERN		452	62	DUBNA	S13
CAMERINI	62	PBC	U CAMERINI +	PR	128	362	62	WISCONSIN+LRL	S13
DARMON	62	FBC	J DARMON,ROUSSET,SIX	PL	3	57	62	EP	S13
CHRISTENSON	63	SPRK	J H CHRISTENSON +	BNL		74	63	PRINCETON	S13
JOVANOVICH	63	SPRK	J V JOVANOVICH +	BNL		42	63	BNL/MD	S13
MEISNER	63	HBC	G W MEISNER,CRAWFORD+	BNL		67	63	L R L	S13
ABASHIAN	64	SPRK	ABASHIAN,ABRAMS +	PRL	13	243	64	ILLINOIS	S13
ADAIR	64	HBC	ADAIR,LEIPUNER	PL	12	67	64	YALE,BNL	S13
AUBERT 1	64	PBC	B AUBERT +	PL	10	215	64	ECOLE POLYTEC.	S13
BEHR	64	FBC	BEHR,AUBERT,BELLOTTI+	DUBNA			64	EP+MILAN	S13
BRISSON	64	FBC	BRISSON,BEHR,BELLOTTI+	DUBNA			64	EP+MILAN	S13
CRAWFORD	64	HBC	CRAWFORD,GOLDEN,MEISNER	BAPS	9	443	64	L R L	S13
CHRISTENSON	64	SPRK	CHRISTENSON,CRONIN,FITCH	PRL	13	139	64	PRINCETON	S13
FUJII	64	SPRK	T.FUJII +	PRL	13	253	64	BNL + MARYLAND	S13
LUERS	64	HBC	D LUERS +	PR	133 B1277		64	B N L	S13
STERN	64	HBC	D STERN +	PRL	12	459	64	WISCONSIN+LRL	S13
ANDERSON	65	HBC	ANDERSON,CRAWFORD,GOLDEN	PRL	14	475	65	L R L	S13
ASTBURY	65	CC	ASTBURY,FINOCCHIARO +	PL	16	80	65	CERN+ZURICH	S13
ASTBURY	65	CC	ASTBURY,MICHELINI +	PREPRINT			65	CERN,ZURICH	S13
AUBERT	65	PBC	AUBERT,BEHR,CANAVAN+	PL	17	59	65	PARIS,ORSAY	S13
AUERBACH	65	SPRK	AUERBACH,LANDE,MANN +	PRL	14	192	65	PENNSYLVANIA	S13
BALDO-CEOLIN	65	PBC	BALDO-CEOLIN,CALIMANI +	NC	38	684	65	PADUA	S13
DE BOUARD	65	CNTR	DE BOUARD,DEKKERS +	PL	15	58	65	CERN+ORSAY+MPI	S13
FRANZINI	65	HBC	FRANZINI,KIRSCH,SCHMIDT+	PREP.NEVIS	135		65	COLUMBIA+RUTGERS	S13
GALBRAITH	65	SPRK	GALBRAITH,MANNING +	PRL	14	383	65	HARK+BRI+RUTH	S13
PRICE	65	HBC	PRICE,CRAWFORD	PRL	15	123	65	L R L	S13

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14 ETA (549,JPG=0-+) I=0

PEVSNER	61	HBC	A PEVSNER +	PRL	7	421	61	HOPKINS/N-WSTRN	S14
ALFF	62	HBC	C ALFF +	PRL	9	322	62	COLUMBIA+RUTU	S14
BASTIEN	62	HBC	PL BASTIEN +	PRL	8	114	62	L R L	S14
CHRETIEN	62	PBC	M CHRETIEN +	PRL	9	127	62	BRA+BRO+HA+MIT+PS	S14
FOELSCHE	62	HBC	HW FOELSCHE,+	PRL	9	223	62	YALE	S14
PICKUP	62	HBC	E PICKUP +	PRL	8	329	62	MRC OTTAWA+ BNL	S14
SHAFER	62	HBC	J BUTTON-SHAFER +	CERN		309	62	L R L	S14
BACCI	63	CNTR	C BACCI +	PRL	11	37	63	FRASCATI	S14
BERTHELOT	63	RVUE	A BERTHELOT	SIENA	2	64	63	RVUE	S14
BUSCHBECK-C	63	HBC	B BUSCHBECK-CZAPP +	SIENA	1	166	63	VIENNA-CERN-AR	S14
CRAWFORD	63	HBC	F S CRAWFORD +	PRL	10	546	63	L R L +DUKE	S14
DELCOURT	63	CNTR	B DELCOURT +	PL	7	215	63	ENS-ORSAY	S14
FOWLER	63	HBC	E C FOWLER +	PRL	10	110	63	DUKE+LRL	S14
MULLER	63	DBC	A MULLER +	SIENA		99	63	SACLAY+ROME	S14
FOELSCHE	64	HBC	H.FOELSCHE+H.L.KRAYBILL	PR	134 B1138		64	YALE	S14
FOSTER	64	HBC	FOSTER,PETERS,HARTUNG +	PR	138 B652		65	WISCON+PURDUE	S14
KRAEMER	64	DBC	KRAEMER,FIELDS,TOOHIG +	PR	136 B496		64	JHU,N-WES,WO COL	S14
PAULI	64	DBC	E PAULI,A MULLER	PL	13	351	64	SACCLAY	S14
FOSTER	65	HBC	FOSTER,GOOD,MEER	ATHENS			65	WISCONSIN,PURDU	S14

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS

BASTIEN	62	HBC	PL BASTIEN +	PRL	8	114	62	I,J,P,G,C	S14
CARMONY	62	HBC	D D CARMONY +	PRL	8	117	62	I,J	S14
ROSENFELD	62	HBC	A H ROSENFELD +	PRL	8	293	62	G	S14

DATA FOR TABLES ON STABLE PARTICLES Cont'd.

STABLE MEANING IMMUNE TO STRONG DECAY

CODE EVENT QUANTITY ERROR+ ERROR- REFERENCE YR TECH SIGN IN PEAK

* INDICATES DATA IGNORED BY PROGRAMS

p

16 PROTON (938,J=1/2) I=1/2

16 PROTON MASS (MEV)

S16M		938.256	0.005		COHEN	63 RVUE

16 PROTON LIFETIME (UNITS 10**26 YR)

S16T *		OVER		1.5	BACKENSTOSS	60 CNTR
S16T *		OVER		1.0	GIAMATI	62 CNTR

16 PROTON MAGNET. MOMENT(E/2MP)

S16MM		2.792816	0.000034		SCHUPP	61 CNTR

n

17 NEUTRON (939,J=1/2) I=1/2

17 NEUTRON-PROTON MASS DIF.(MEV)

S17D		1.2939	0.0004		BONDELID	60 CNTR
S17D		1.2933	0.0001		SALGO	64 CNTR

17 NEUTRON LIFETIME (UNITS 10**3)

S17T		1.01	0.03	0.03	SOSNOVSKIJ	59 PILE

17 NEUTRON MAGNETIC MOMENT (MAGNETONS,938.2 MEV)

S17MM		-1.913148	0.000066		COHEN	57 RVUE

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18 LAMBDA (1115,JP=1/2+) I=0

18 LAMBDA MASS (MEV)

S18M		1115.25	0.36		BALTAY	62 HBC
S18M	25	1115.04	0.41		ARMENTEROS	62 HBC
S18M	317	1115.40	0.13		BHOWMIK	63 RVUE
S18M *		LAMBDA MASS TO BE RAISED OF	0.043	BECAUSE	PROTON MASS RAISED	
S18M *		1115.84	0.31		SCHMIDT	64 HBC

18 LAMBDA LIFETIME (UNITS 10**-10)

S18T	188	2.63	0.21	0.21	BOLDT	58 CC
S18T	74	2.75	0.45	0.38	BLUMENFELD	58 CC
S18T	61	2.08	0.46	0.31	BROWN	58 PBC
S18T	40	3.04	0.78	0.51	COOPER	58 CC
S18T	454	2.29	0.15	0.13	EISLER	58 HBC
S18T	825	2.72	0.16	0.16	CRAWFORD	59 HBC
S18T	140	2.72	0.29	0.27	BOWEN	60 CC
S18T	600	2.69	0.14	0.12	FUNG	62 PBC
S18T	799	2.69	0.11	0.11	HUMPHREY	62 HBC
S18T	748	2.58	0.11	0.11	BERTANZA	62 HBC
S18T	900	2.44	0.11	0.11	GARFINKEL	62 HBC
S18T	2250	2.31	0.09	0.09	CRONIN	62 SPRK
S18T	5000	2.68	0.03	0.03	GOLDEN	62 HBC
S18T		2.60	0.28	0.20	C-C CHANG	62 HBC
S18T	2500	2.70	0.07	0.07	MURRAY	62 HBC
S18T	2239	2.36	0.06	0.06	BLOCK	63 HEBC
S18T	820	2.75	0.12	0.12	BERGE	63 HBC
S18T	706	2.76	0.20		CHRETIEN	63 PBC
S18T	794	2.59	0.09		HUBBARD	64 HBC
S18T	1378	2.59	0.07		SCHWARTZ	64 HBC
S18T	2260	2.31	0.10		KREISLER	64 SPRK
S18T		2.6	0.1		HILL	65 SPRK

18 LAMBDA PARTIAL DECAY MODES

S18P1	LAMBDA INTO PROTON PI-	S16S 8
S18P2	LAMBDA INTO NEUTRON PIO	S17S 9
S18P3	LAMBDA INTO PROTON MU- NEUTRINO	S16S 4S 2
S18P4	LAMBDA INTO PROTON E- NEUTRINO	S16S 3S 1

18 LAMBDA BRANCHING RATIOS

S18R1*		LAMBDA INTO (P PI-)/((P PI-)+(N PIO))				(P1)/(P1+P2)
S18R1		0.627	0.031		CRAWFORD	59 HBC
S18R1		0.65	0.05		COLUMBIA	60 HBC
S18R1	903	0.643	0.016		HUMPHREY	62 HBC
S18R1		0.685	0.017		ANDERSON	62 HBC
S18R2*		LAMBDA INTO (N PIO)/((P PI-)+(N PIO))				(P2)/(P1+P2)
S18R2		0.23	0.09		EISLER	57 PBC
S18R2		0.43	0.14		CRAWFORD	59 HBC
S18R2		0.28	0.08		BAGLIN	60 PBC
S18R2		0.35	0.05		BROWN	63 XBC
S18R2	75	0.291	0.034		CHRETIEN	63 PBC
S18R3*		LAMBDA INTO (P E- NEU)/TOTAL	(UNITS	10**-3)		(P4)/(P1+P2)
S18R3	15	2.0	0.5		HUMPHREY	61 RVUE
S18R3	8	2.9	1.5	1.2	AUBERT	62 FBC
S18R3	150	0.82	0.12	0.13	ELY	63 FBC
S18R3	20	1.55	0.34		LIND	64 HBC
S18R3	102	0.78	0.12		BAGLIN	64 FBC
S18R4*		LAMBDA INTO (P MU- NEU)/TOTAL	(UNITS	10**-4)		(P3)/(P1+P2)
S18R4*	1	0.2 OR GREATER			GOOD	62 HBC
S18R4*	1	1.0 OR LESS			ALSTON	63 HBC
S18R4*	2	1.0 OR LESS			KERNAN	64 FBC
S18R4*		BETWEEN 1.3 AND 6.0			LIND	64 HBC
S18R4	2	1.5	1.2		RONNE	64 FBC

18 LAMBDA MAGNETIC MOMENT (MAGNETONS,938.26 MEV)

S18MM	-1.5	0.5		COOL	62 SPRK
S18MM	0.0	0.6		KERNAN	63 CC
S18MM	8553	-1.37	0.72	ANDERSON	64 HBC
S18MM	151	-0.5	0.28	CHARRIERE	65 EMUL
S18MM	2534	-0.77	0.27	HILL	65 SPRK

18 LAMBDA DECAY PARAMETERS

S18A *	ALPHAO /ALPHA- FOR LAMBDA (L INTO PIO N/L INTO PI- P)				
S18A *		1.10	0.27	CORK	60 CNTR
S18A-*	ALPHA LAMBDA- (LAMBDA INTO PI- PROTON)				
S18A-		0.66	0.05	CRONIN	63 CNTR
S18A-		0.683	0.066	MERRILL	65 HBC

REFERENCES FOR TABLES ON STABLE PARTICLES Cont'd.

IDENTIFIC.	YR	AUTHORS	JOUR.VOL	PAGE	YR	INSTITUTION	COD
p		16 PROTON (938,J=1/2) I=1/2					
BACKENSTOSS	60	CNTR G K BACKENSTOSS +	NC	16 749	60	CERN	S16
SCHUPP	61	CNTR SCHUPP,PIDD,CRANE	PR	121 1	61	MICHIGAN	S16
GIAMATI	62	CNTR C C GIAMATI + F REINES	PR	126 2178	62	CASE IT	S16
COHEN	63	RVUE E R COHEN,JWM DUMOND	REPORT IUPAP		63	RVUE	S16
n		17 NEUTRON (939,J=1/2) I=1/2					
COHEN	57	RVUE COHEN, CROWE,DUMOND	NC	5 541	57	REVUE	S17
SOSNOVSKIJ	59	PILE SOSNOVSKIJ +	JETP	9 717	59	RUSSIA	S17
BONDELID	60	CNTR R O BONDELID +	PR	120 887	60	USNR+CATOUNI.	S17
SALGO	64	CNTR SALGO,STAUB,WINKLER+	NP	53 457	64	ZURICH	S17
Λ		18 LAMBDA (1115,JP=1/2+) I=0					
EISLER	57	PBC F EISLER +	NC	5 1700	57	COLUMBIA+BNL	S18
BLUMENFELD	58	CC H BLUMENFELD +	CERN	270	58	COLUMBIA	S18
BOLDT	58	CC E BOLDT +	PRL	1 148	58	M I T	S18
BROWN	58	PBC J BROWN +	CERN	270	58	MICHIGAN	S18
COOPER	58	CC A COOPER +	CERN	270	58	JUNGFRAU	S18
EISLER	58	HBC F EISLER +	CERN	270	58	COLUMBIA+PI+BO	S18
CRAWFORD	59	HBC F S CRAWFORD +	PRL	2 266	59	L R L	S18
BAGLIN	60	PBC C BAGLIN +	NC	18 1043	60	ECOLE POLYT	S18
BOWEN	60	CC T BOWEN +	PR	119 2030	60	PRINCETON	S18
CORK	60	CNTR CORK,KERTH,WENZEL +	PR	120 1000	60	LRL+PRINC+BNL	S18
COLUMBIA	60	HBC REPORTED BY M SCHWARTZ.	ROCH	726	60	COLUMBIA	S18
HUMPHREY	61	RVUE W E HUMPHREY +	PRL	6 478	61	L R L	S18
ANDERSON	62	HBC J A ANDERSON +	CERN	832	62	L R L	S18
ARMENTEROS	62	HBC R ARMENTEROS +	CERN	236	62	CERN ETC	S18
AUBERT	62	PBC AUBERT,BRISSON,HENNESSY+	NC	25 479	62	ECOLE POLYT.	S18
BALTAY	62	HBC C BALTAY +	CERN	233	62	YALE,BRKH	S18
BERTANZA	62	HBC L BERTANZA,MONETI	PREPRINT	D105	62	B N L	S18
CHANG	62	HBC C-C CHANG	NSA	16 2967	662	DUKE	S18
COOL	62	SPRK COOL,JENKINS,KYCIA,HILL+	PR	127 2223	62	B N L	S18
CRONIN	62	SPRK J CRONIN +	CERN	459	62	PRINCETON	S18
FUNG	62	PBC S YIU FUNG	BAPS	7 619	62	L R L	S18
GARFINKEL	62	HBC A F GARFINKEL	NEVIS104 AND PRIV COMM		62 63	COLUMBIA COLUMBIA	S18 S18
GOLDEN	62	HBC R L GOLDEN +	CERN	839	62	L R L	S18
GOOD	62	HBC M L GOOD,V G LIND	PRL	9 518	62	WISCONSIN	S18
HUMPREY	62	HBC W HUMPREY,R ROSS	PR	127 1305	62	L R L	S18
MURRAY	62	HBC MURRAY +	CERN	839	62	L R L	S18
ALSTON	63	HBC M H ALSTON +	UCLRL	10926	63	L R L	S18
BERGE	63	HBC J P BERGE	THESIS		63	L R L	S18
BHOMWIK	63	RVUE B BHUMWIK,DP GOYAL	NC	28 1494	63	RVUE	S18
BLOCK	63	HEBC M M BLOCK +	PR	130 766	63	N WESTERN	S18
BROWN	63	XBC J L BROWN +	PR	130 769	63	LRL+MICHIG	S18
CHRETIEN	63	PBC M CHRETIEN +	PR	131 2208	63	BRA+BRO+HAR+MIT	S18
CRONIN	63	CNTR CRONIN,OVERSETH	PR	129 1795	63	PRINCETON	S18
ELY	63	FBC R P ELY +	PR	131 868	63	LRL+UNIV.COL.	S18
KERNAN	63	CC KERNAN,NOVEY,WARSHAW +	PR	129 870	63	ARGONNE	S18
ANDERSON	64	HBC J.A.ANDERSON+F.S.CRAWFORD	PRL	13 167	64	LRL	S18
BAGLIN	64	FBC C BAGLIN +	NC	35 977	64	EP CE UCL RUT BE	S18
KREISLER	64	SPRK KREISLER,OVERSETH +	PR	136 B1074	64	PRINCETON	S18
KERNAN	64	PBC A KERNAN +	PR	133 B1271	64	LRL+UNIV.COL.	S18
HUBBARD	64	HBC J R HUBBARD +	PR	135 B 183	64	L R L	
LIND	64	HBC V.G.LIND +	PR	135 B1483	64	WISCONSIN	S18
RONNE	64	FBC RONNE,BAGLIN,SIX +	PL	11 357	64	CE+EP+UCL+BERGEN	S18
SCHMIDT	64	HBC SCMIDT,STEINBERGER +	PREPRINT		64	COLUMBIA	S18
SCHWARTZ	64	HBC J SCHWARTZ	UCRL	11360	64	L R L	S18
CHARRIERE	65	EMUL CHARRIERE,GAILLOUD +	PL	15 66	65	LAU+BRI+CERN+MPI	S18
HILL	65	SPRK HILL,LI,JENKINS,KYCIA+	PRL	15 85	65	MIT+BNL	S18
MERRILL	65	HBC DEANE MERRILL	THESIS		65	L R L	S18

DATA FOR TABLES ON STABLE PARTICLES Cont'd.

CODE EVENT QUANTITY ERROR+ ERROR- REFERENCE YR TECH SIGN
IN PEAK

*INDICATES DATA IGNORED BY PROGRAMS

Σ^+

19 SIGMA+ (1189,JP=1/2+) I=1

19 SIGMA+ MASS (MEV)

S19M		1189.40	0.15		BARKAS	63	EMUL
S19M		1189.5	0.5		BURNSTEIN	64	HBC
S19M	58	1189.45	0.22		BHOWMIK	64	EMUL
S19M *		1189.58	0.13		SCHMIDT	64	HBC

19 SIGMA+ LIFETIME (UNITS 10**-10)

S19T *					GLASER	58	RVUE
S19T	127	0.98	0.16	0.12	PUSCHEL	60	EMUL
S19T	41	0.82	0.34	0.20	EVANS	60	EMUL
S19T	117	0.85	0.14	0.11	FREDEN	60	EMUL
S19T	54	0.80	0.10	0.067	KAPLON	60	EMUL
S19T	23	0.76	0.22	0.14	CHIESA	61	EMUL
S19T	49	0.75	0.13	0.09	BERTHELOT	61	PBC
S19T	140	0.82	0.10	0.08	BARKAS	61	EMUL
S19T	192	0.749	0.056	0.052	GRARD	62	HBC
S19T	456	0.769	0.04	0.04	HUMPHREY	62	HBC
S19T	203	0.84	0.12	0.08	BHOWMIK	64	EMUL

19 SIGMA+ PARTIAL DECAY MODES

S19P1	SIGMA + INTO PROTON PIO	S16S 9
S19P2	SIGMA + INTO NEUTRON PI+	S17S 8
S19P3	SIGMA + INTO NEUTRON PI+ GAMMA	S17S 8S 0
S19P4	SIGMA + INTO LAMBDA E+ NEU	S18S 3S 0
S19P5	SIGMA + INTO PROTON GAMMA	S16S 0
S19P6	SIGMA + INTO NEUTRON MU+ NEUTRINO	S17S 4S 2
S19P7	SIGMA + INTO NEUTRON E+ NEUTRINO	S17S 3S 1

19 SIGMA+ BRANCHING RATIOS

S19R1*	SIGMA+ INTO (NEUTRON PI+)/(NUCLEON PI)						(P2)/(P1+P2)
S19R1	308	0.490	0.024		HUMPHREY	62	HBC
S19R2*	SIGMA+ INTO (NEUTRON PI+ GAM)/(PI+ N)						(10**-4) (P3)/(P2)
S19R2*	ABOUT			0.4	COURANT	63	HBC
S19R3*	SIGMA+ INTO (LAMBDA E+ NEU)/(PI+ N)						(10**-4) (P4)/(P2)
S19R3*		0.3	APPROX.		COURANT	64	HBC
S19R4*	SIGMA+ INTO (N MU+/NEU)/(PI+N)						(10**-4) (P6)/(P2)
S19R4*	1	EVENT FOUND,NO BRAN.RAT QUOTED			GALTIERI	62	EMUL
S19R4*	0	LESS THAN		2.3	BURNSTEIN	63	HBC
S19R5*	SIGMA+ INTO (N E+ NEU)/(N PI+) (UNITS 10**-4) (P7)/(P2)						
S19R5*	0	LESS THAN		2.6	BURNSTEIN	63	HBC
S19R5*		LESS THAN		4.0	MURPHY	64	PBC
S19R5*	1	LESS THAN		1.03	NAUENBERG	64	HBC
S19R6*	SIGMA+ INTO (P GAMMA)/(P PIO)						(10**-3) (P5)/(P1)
S19R6*	1	0.68	OR LESS		CARRARA	64	HBC
S19R6	24	0.37	0.08		BAZIN	65	HBC

19 SIGMA+ MAGNETIC MOMENT (MAGNETONS,938.26 MEV)

S19MM	24	4.3	1.5		MCINTURFF	64	EMUL

19 SIGMA+ DECAY PARAMETERS

S19A+*	ALPHA SIGMA+ (SIGMA + INTO PI+ NEUTRON)						
S19A+*		-0.03	0.08		CORK	60	CNTR
S19A+*		-0.20	0.24		TRIPP	62	HBC
S19A0*	ALPHA SIGMA0 (SIG+ INTO PIO PROTON)						
S21A0*		-0.90	0.25		TRIPP	62	HBC
S19A0*		-0.73	0.08	0.09	BEALL	62	CNTR

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20 SIGMA- (1198,JP=1/2+) I=1

20 SIGMA- MASS (MEV)

S20M		1197.6	0.5		BARKAS	63	EMUL
S20M	588	1197.0	0.2		BURNSTEIN	64	HBC

20 SIGMA- MASS DIFFER.(-)-(+)(MEV)

S20D	2500	8.25	0.25		DOSCH	65	HBC

20 SIGMA- LIFETIME (UNITS 10**-10)

S20T		1.67	0.40	0.28	BROWN	58	PBC
S20T		1.89	0.33	0.25	EISLER	58	PBC
S20T		1.45	0.12	0.12	CRAWFORD	59	HBC
S20T	45	1.35	0.32	0.17	CHIESA	61	EMUL
S20T	41	1.75	0.39	0.30	BARKAS	61	EMUL
S20T	1208	1.58	0.06	0.06	HUMPHREY	62	HBC

20 SIGMA- PARTIAL DECAY MODES

S20P1	SIGMA - INTO NEUTRON PI-	S17S 8
S20P2	SIGMA - INTO NEUTRON PI- GAMMA	S17S 8S 0
S20P3	SIGMA - INTO NEUTRON MU- NEUTRINO	S17S 4S 2
S20P4	SIGMA - INTO NEUTRON E- NEUTRINO	S17S 3S 1
S20P5	SIGMA - INTO LAMBDA E- NEUTRINO	S18S 3S 1

20 SIGMA- BRANCHING RATIOS

S20R1*	SIGMA - INTO (N MU- NEU)/(N PI-) (UNITS 10**-3) (P3)/(P1)						
S20R1	22	0.66	0.15		COURANT	64	HBC
S20R2*	SIGMA - INTO (N E- NEU)/(N PI-) (UNITS 10**-3) (P4)/(P1)						
S20R2	9	1.0	0.4	0.3	MURPHY	66	PBC
S20R2	16	1.37	0.34		NAUENBERG	64	HBC
S20R2	16	1.15	0.4		MILLER	64	FBC
S20R2	31	1.4	0.3		COURANT	64	HBC
S20R3*	SIGMA - INTO (LAMBDA E- NEU)/(N PI-) (UN. 10**-4)(P5)/(P1)						
S20R3	11	0.75	0.28		COURANT	64	HBC
S20R4*	SIGMA - INTO (N PI- GAMMA)/(N PI-) (UN. 10**-4) (P2)/(P1)						
S20R4*	ABOUT			0.1	COURANT	63	HBC

20 SIGMA- DECAY PARAMETERS

S20A-*	ALPHA SIGMA-						
S20A-*		-0.16	0.21		TRIPP	62	HBC

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21 SIGMA 0 (1193,JP=1/2+) I=1

21 SIGMA- MASS DIFFER.(-)-(0)(MEV)

S21D1	18	4.75	0.1		BURNSTEIN	64	HBC
S21D1	37	4.87	0.12		DOSCH	65	HBC

21 SIGMA0 LIFETIME (UNITS 10**-14)

S21T *		1.0 OR LESS			DAVIS	62	EMUL

REFERENCES FOR TABLES ON STABLE PARTICLES Cont'd.

IDENTIFIC.	YR	AUTHORS	JOUR.VOL PAGE	YR	INSTITUTION	COD

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19 SIGMA + (1189,JP=1/2+) I=1

GLASER	58	RVUE	D A GLASER +	CERN	270	58	RVUE	S19
EVANS	60	EMUL	D EVANS +	NC 15	873	60	BRISTOL	S19
FREDEN	60	EMUL	S C FREDEN +	NC 16	611	60	L R L LIV	S19
KAPLON	60	EMUL	M F KAPLON +	ANP 9	139	60	ROCHESTER	S19
CORK	60	CNTR	CORK,KERTH,WENZEL +	PR 120	1000	60	L R L	S19
PUSCHEL	60	EMUL	W PUSCHEL	NP 20	254	60	M PLANCK	S19
BARKAS	61	EMUL	W H BARKAS +	PR 124	1209	61	L R L	S19
BERTHELOT	61	PBC	A BERTHELOT +	NC 21	693	61	SACLAY	S19
CHIESA	61	EMUL	A M CHIESA +	NC 19	1171	61	TORINO	S19
BEALL	62	CNTR	BEALL,CORK,KEEFE +	PRL 8	75	62	L R L	S19
GRARD	62	HBC	F GRARD + G A SMITH	PR 127	607	62	L R L	S19
GALTIERI	62	EMUL	BARBARO-GALTIERI,BARKAS+	PRL 9	26	62	L R L	S19
HUMPHREY	62	HBC	W E HUMPHREY + R R ROSS	PR 127	1305	62	L R L	S19
TRIPP	62	HBC	TRIPP,WATSON,FERROLUZZI	PRL 9	66	62	L R L	S19
BARKAS	63	EMUL	BARKAS,DYER,HECKMAN	PRL 11	26	63	L R L	S19
ALSO	61	EMUL	J DYER	UCRL	9450	61	L R L	S19
COURANT	63	HBC	H COURANT +	SIENA	15	63	CERN+MARYLAND	S19
BHOWMIK	64	EMUL	BHOWMIK,JAIN,MATHUR +	NP 53	22	64	DELHI	S19
BURNSTEIN	64	HBC	R.A.BURNSTEIN +	PRL 13	66	64	MARYLAND	S19
CARRARA	64	HBC	CARRARA,CRESTI +	PL 12	72	64	PADUA	S19
COURANT	64	HBC	COURANT,FILTHUTH +	PR 136B1791		64	CERN+HID+MAR+BNL	S19
MCINTURFF	64	EMUL	MCINTURFF,ROOS	PRL 13	246	64	VANDERBILT	S19
MURPHY	64	PBC	C T MURPHY	PR 134	B188	64	WISCONSIN	S19
SCHMIDT	64	HBC	SCHMIDT,STEINBERGER +	PREPRINT		64	COLUMBIA	S19
BAZIN	65	HBC	BAZIN,BLUMENFELD,CHANG+	PRL 14	154	65	PRINCETON	S19
NAUENBERG	64	HBC	NAUENBERG,SCHMIDT +	PRL 12	679	64	COL+RUTG+PRINC	S19
ALSO	65	HBC	ALFF,GELFAND,NAUENBERG +	PR 137B1105		65	COLUMBIA,BNL +	S19

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS

TRIPP	62	HBC	TRIPP,WATSON,FERROLUZZI	PRL	8	175	62	P	S19
ALFF	63	HBC	C ALFF +	SIENA	1	205	63	COLUM+RUTG+BNL	S19
COURANT	63	HBC	H COURANT +	SIENA	1	73	63	MARYL+CERN+NRL	S19

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20 SIGMA - (1198,JP=1/2+) I=1

BROWN	58	PBC	J BROWN +	CERN	270	58	MICHIGAN	S20
EISLER	58	PBC	F EISLER +	CERN	270	58	COLUMBIA	S20
CRAWFORD	59	HBC	F S CRAWFORD +	PRIV COMM	59	L R L		S20
BARKAS	61	EMUL	W H BARKAS +	PR 124	1209	61	L R L	S20
CHIESA	61	EMUL	A M CHIESA +	NC 19	1171	61	TOKINO	S20
HUMPHREY	62	HBC	W E HUMPHREY + R R ROSS	PR 127	1305	62	L R L	S20
TRIPP	62	HBC	TRIPP,WATSON,FERROLUZZI	PRL 9	66	62	L R L	S20
BARKAS	63	EMUL	W H BARKAS,DYER,HECKMAN	PRL 11	26	63	L R L	S20
COURANT	63	HBC	H COURANT +	SIENA	15	63	CERN+MARYLAND	S20
BURNSTEIN	64	HBC	R.A.BURNSTEIN +	PRL 13	66	64	MARYLAND	S20
COURANT	64	HBC	COURANT,FILTHUTH +	PR 136B1791		64	CERN+HID+MAR+BNL	S20
MILLER	64	FBC	MILLER,STANNARD +	PL 11	262	64	UNL+EP+BERGEN	S20
MURPHY	64	XBC	C.T.MURPHY	PR 134	B188	64	WISCONSIN	S20
NAUENBERG	64	HBC	U NAUENBERG +	PRL 12	679	64	COL+RUTG+PRIN	S20
			AND	PRIV COMM	MAY	64	COL+RUTG+PRINC	S20
DOSCH	65	HBC	DOSCH,ENGELMANN +	PL 14	239	65	HEIDELBERG	S20

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21 SIGMA 0 (1193,JP=1/2+) I=1

DAVIS	62		D H DAVIS +	PR 127	605	62	EFINS	S21
BURNSTEIN	64	HBC	R.A.BURNSTEIN +	PRL 13	66	64	MARYLAND	S21
DOSCH	65	HBC	DOSCH,ENGELMANN +	PL 14	239	65	HEIDELBERG	S21

DATA FOR TABLES ON STABLE PARTICLES Concluded

STABLE MEANING IMMUNE TO STRONG DECAY

CODE EVENT QUANTITY ERROR+ ERROR- REFERENCE YR TECH SIGN
IN PEAK

* INDICATES DATA IGNORED BY PROGRAMS

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22 XI- (1321,JP=1/2) I=1/2

22 XI- MASS (MEV)

S22M	12	1320.4	2.2		UCRL 8030	58	RVUE
S22M	11	1317.0	2.2		WANG	61	PBC
S22M	18	1317.9	1.9		FOWLER	61	PBC
S22M	1	1322.0	1.3		BROWN	62	HBC
S22M		1321.0	0.5		BERTANZA	62	HBC
S22M	62	1321.1	0.65		SCHNEIDER	63	HBC
S22M	517	1321.4	0.4		JANEAU	63	FBC
S22M	505	1320.4	0.3		LONDON	64	HBC
S22M	241	1321.1	0.3		BADIER	64	HBC
S22M *		ALL MASSES ABOVE	TO BE RAISED 0.09 MEV BECAUSE LAMBDA RAISED				

22 XI- LIFETIME (UNITS 10**-10)

S22T	11	3.5	3.4	1.23	WANG	61	PBC
S22T	18	1.28	0.41	0.25	FOWLER	61	PBC
S22T	517	1.86	0.15	0.14	JAUNEAU	63	FBC
S22T	62	1.55	0.31	0.31	SCHNEIDER	63	HBC
S22T	332	1.80	0.16	0.15	CONNOLLY	63	HBC
S22T	356	1.77	0.12		CARMONY	64	HBC
S22T	794	1.69	0.07		HUBBARD	64	HBC

22 XI- PARTIAL DECAY MODES

S22P1	XI- INTO LAMBDA PI-	S18S 8
S22P2	XI- INTO LAMBDA E- NEUTRINO	S18S 3S 1
S22P3	XI- INTO NEUTRON PI-	S17S 8

22 XI- BRANCHING RATIOS

S22R1*	XI- INTO (LAMBDA E- NEU)/(LAMBDA PI-) (10**-3) (P2)/(P1)					
S22R1*	1	1.7	OR LESS		CARMONY +	63 HBC QUOTED BY TICHO
S22R2*	XI- INTO (NEUTRON PI-)/(LAMBDA PI-) (10**-3) (P3)/(P1)					
S22R2*	0	LESS THAN		5.0	FERRO-LUZZI	63 HBC

22 XI- DECAY PARAMETER

S22A * ALPHA XI-

S22A		-0.44	0.11		JAUNEAU	63 FBC
S22A		-0.49	0.16		CONNOLLY	63 HBC
S22A	62	-0.73	0.21		SCHNEIDER	64 HBC
S224	240	-0.5	0.35		BADIER	64 HBC
S22A	356	-0.62	0.12		CARMONY	64 HBC
S22A	900	-0.368	0.057		BERGE	65 HBC
S22A *3278		-0.400	0.047		MERRILL	65 HBC

S22B * BETA XI-

S22B		-0.02	0.22		CONNOLLY	63 HBC
S22B		-0.24	0.53		JAUNEAU	63 FBC
S22B	62	0.44	0.36		SCHNEIDER	64 HBC
S22B	356	0.63	0.16		CARMONY	64 HBC

S22C * GAMMA XI-

S22C		0.87	0.10		CONNOLLY	63 HBC
S22C		0.87	0.05	0.28	JAUNEAU	63 FBC
S22C	356	0.46	0.28		CARMONY	64 HBC
S22C	62	0.52	0.44		SCHNEIDER	64 HBC

S22F * PHI ANGLE (TAN(PHI)=BETA/GAMMA) (DEGREE)

S22F		-16.	37.		JAUNEAU	63 FBC
S22F	356	54.0	25.0		CARMONY	64 HBC
S22F		-1.0	15.0		CONNOLLY	63 HBC
S22F	62	45.0	30.0		SCHNEIDER	64 FBC
S22F	900	0.45	10.8		BERGE	65 HBC

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23 XI 0 (1314,JP=1/2) I=1/2

23 XI MASS DIFFERENCE (-)-(0)(MEV)

S23D	23	6.8	1.6		JAUNEAU	63 FBC
S23D	34	6.9	2.2		LONDON	64 HBC
S23D	45	6.1	1.6		CARMONY	64 HBC

23 XI 0 LIFETIME (UNITS 10**-10)

S23T	1	1.5			ALVAREZ	59	HBC
S23T	24	3.9	1.4	0.80	JAUNEAU	63	FBC
S23T	45	3.5	1.0	0.8	CARMONY	63	HBC
S23T	101	2.5	0.4	0.3	HUBBARD	63	HBC

23 XI 0 PARTIAL DECAY MODES

S23P1	XI 0 INTO LAMBDA PIO	S18S 9
S23P2	XI 0 INTO PROTON PI-	S16S 8
S23P3	XI 0 INTO PROTON E- NEU	S16S 3S 1
S23P4	XI 0 INTO SIGMA+ E- NEU	S19S 3S 1
S23P5	XI 0 INTO SIGMA- E+ NEU	S20S 3S 1

23 XI 0 BRANCHING RATIOS

S23R1*	XI 0 INTO(PROTON PI-)/(LAMBDA PIO) (P2)/(P1)					
S23R1*	0	0.027	OR LESS		TICHO	63 HBC
S23R2*	XI 0 INTO(PROTON E- NEU)/(LAMBDA PIO) (P3)/(P1)					
S23R2*	0	0.027	OR LESS		TICHO	63 HBC
S23R3*	XI 0 INTO(SIGMA+ E- NEU)/(LAMBDA PIO) (P4)/(P1)					
S23R3*	0	0.013	OR LESS		TICHO	63 HBC

23 XI 0 DECAY PARAMETER

S23A * ALPHA XI 0

S23A		-0.51	0.53	CONNOLLY	63 HBC
S23A		-0.09	0.42	CARMONY	65 HBC
S23A *106		-0.118	0.161	BERGE	65 HBC
S23A 553		-0.384	0.13	MERRILL	65 HBC

S23F * PHI ANGLE XI0 (TAN(PHI)=BETA/GAMMA) (DEGREE)

S23F	106	19.8	25.0	BERGE	65 HBC
S23F *553		-0.2	1.1	MERRILL	65 HBC

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24 OMEGA- (1675,JP=3/2+) I=0

24 OMEGA- MASS (MEV)

S24 * QUANTUM NUMBERS ASSIGNED FROM SU3

S24M *	1	1620.0	25.0	10.0	EISENBERG	54 EMUL
S24M	2	1675.0	3.0		BARNES	64 HBC
S24M	1	1673.0	8.0		ABRAMS	64 HBC

24 OMEGA - LIFETIME (UNITS 10**-10SEC)

S24T *	1	0.7		BARNES	64 HBC
S24T	4	1.3	0.7	ABRAMS	64 RVUE INCLUDES ABOVE

REFERENCES FOR TABLES ON STABLE PARTICLES Concluded

IDENTIFIC.	YR	AUTHORS	JOUR.VOL	PAGE	YR	INSTITUTION	COD

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22 XI - (1321,JP=1/2) I=1/2

UCRL8030	58 RVUE	W H BARKAS A H ROSENFELD	UCRL8030		58	RVUE			S22
FOWLER	61 PBC	W B FOWLER +	PRL	6	134	61	L R L		S22
WANG	61 PBC	K C WANG +	JETP	13	512	61	JINK RUSS		S22
BERTANZA	62 HBC	L BERTANZA +	PRL	9	229	62	BROOKHAV.		S22
BROWN	62 HBC	H N BROWN +	PRL	8	255	62	BROOKHAV		S22
CONNOLLY	63 HBC	P L CONNOLLY +	SIENA		34	63	B N L		S22
		AND PRIV COMM BY G	LONDON APRIL		64	B N L			S22
FERRO-LUZZI	63 HBC	M FERRO-LUZZI +	PR	130	1568	63	L R L		S22
JAUNEAU	63 FBC	L JAUNEAU +	SIENA		4	63	EP+CERN+UC+RU+BE		S22
ALSO	63 FBC	L JAUNEAU +	PL	4	49	63	EP+		S22
SCHNEIDER	63 HBC	H SCHNEIDER	PL	4	360	63	CERN		S22
TICHO	63 RVUE	H K TICHO	BNL		410	63	RVUE		S22
CARMONY	64 HBC	D D CARMONY +	PRL	12	482	64	UCLA		S22
LONDON	64 HBC	G W LONDON +	BAPS	9	22	64	BNL+SYR		S22
BADIER	64 HBC	J.BADIER +	DUBNA 64			64	EP+SACLAY+AMST		S22
HUBBARD	64 HBC	J.R.HUBBARD +	PR	135	B183	64	LRL		S22
BERGE	65 HBC	P BERGE +	UCRL 11529			65	L R L		S22

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS

CARMONY	64 HBC	D D CARMONY +	PRL	12	482	64	UCLA, J		S22
SHAFER	64 HBC	J B SHAFER, ALVAREZ	MEMO 508		MAY	64	L R L, J		S22
MERRILL	65 HBC	DEANE MERRILL	THESIS			65	L R L	J	S22

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23 XI 0 (1314,JP=1/2) I=1/2

ALVAREZ	59 HBC	L W ALVAREZ +	PRL	2	215	59	L R L		S23
JAUNEAU	63 FBC	L JAUNEAU +	SIENA	1	1	63	EP+CERN+UC+RU+BE		S23
ALSO	63 FBC	L JAUNEAU +	PL	4	49	63	EP+		S23
TICHO	63 RVUE	CARMONY, TICHO +	BNL		410	63	LRL+UCLA		S23
CARMONY	64 HBC	D D CARMONY +	PRL	12	482	64	UCLA		S23
HUBBARD	64 HBC	J.R.HUBBARD +	PR	135	B183	64	LRL		S23
LONDON	64 HBC	G W LONDON +	BAPS	9	22	64	BNL+SYR		S23
BERGE	65 HBC	P BERGE +	UCRL 11529			65	L R L		S23
MERRILL	65 HBC	DEANE MERRILL	THESIS			65	L R L		S23

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24 OMEGA - (1675,JP=3/2+) I=0

EISENBERG	54 EMUL	Y EISENBERG	PR	96	541	54	CORNEL		S24
BARNES	64 HBC	V E BARNES +	PRL	12	204	64	B N L		S24
BARNES	64 HBC	BARNES,CONNOLLY +	DUBNA			64	B N L		S24
ABRAMS	64 HBC	ABRAMS,BURNSTEIN +	PRL	13	670	64	MARYLAND+NRLW		S24

DATA ON MESON RESONANCES

CODE EVENT QUANTITY ERROR+ ERROR- REFERENCE YR TECH SIGN
IN PEAK

• INDICATES DATA IGNORED BY PROGRAMS

1 OMEGA (780,JPG=1--) I=0

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1 OMEGA MASS (MEV)

U 1M	400	782.0	1.0	ALFF	62	HBC	
U 1M	64	779.4	1.4	ARMENTEROS	62	HBC	
U 1M •	90	784.0	0.9	GELFAND	63	HBC	
U 1M	650	782.0		MURRAY	63	HBC	
U 1M	34	784.0	1.0	ARMENTEROS	63	HBC	
U 1M	220	781.0	2.0	KRAEMER	64	DBC	
U 1M		785.6	1.2	MILLER D C	65	HBC	

1 OMEGA FULL WIDTH (MEV)

U 1W •	90	9.5	2.1	GELFAND	63	HBC
U 1W	34	9.0	3.0	ARMENTEROS	63	HBC
U 1W		13.4	2.0	MILLER D C	65	HBC

1 OMEGA PARTIAL DECAY MODES

U 1P1	OMEGA INTO PI+ PI- PIO	S 8S 8S 9
U 1P2	OMEGA INTO PI+ PI-	S 8S 8
U 1P3	OMEGA INTO PI+ PI- GAMMA	S 8S 8S 0
U 1P4	OMEGA INTO PIO GAMMA	S 9S 0
U 1P5	OMEGA INTO 2PIO GAMMA	S 9S 9S 0
U 1P6	OMEGA INTO MU+ MU-	S 4S 4
U 1P7	OMEGA INTO E+ E-	S 3S 3
U 1P8	OMEGA INTO ETA GAMMA	S14S 0
U 1P9	OMEGA INTO ETA PIO	S14S 9

1 OMEGA BRANCHING RATIOS

U 1R1•	OMEGA INTO NEUTRAL/(PI+ PI- PIO) I.E.						(P4+P5)/(P1)
U 1R1		0.10	0.04	ALFF	62	HBC	
U 1R1•	40	0.10	0.03	MURRAY	63	HBC	
U 1R1		0.17	0.04	ARMENTEROS	63	HBC	
U 1R1	20	0.11	0.02	BUSCHBECK-C	63	HBC	
U 1R1	35	0.08	0.03	KRAEMER	64	DBC	
U 1R1		0.13	0.035	MILLER D C	65	HBC	
U 1R1	348	0.697	0.016	FLATTE	65	HBC	
U 1R2•	OMEGA INTO (PI+ PI-)/(PI+ PI- PIO)						(P2)/(P1)
U 1R2•		0.010 OR LESS		BUTTON	61	HBC	
U 1R2•		0.02 OR LESS		ALFF	62	HBC	
U 1R2•	100	0.05 OR GREATER		FICKINGER	63	HBC	
U 1R2•		0.07		ALITTI	63	HBC	
U 1R2•	32	0.045	0.016 0.01	MURRAY	63	HBC	NO INTERFERE
U 1R2•		0.05 OR LESS		ARMENTEROS	63	HBC	
U 1R2•		0.02		JAMES	63	HBC	
U 1R2•		0.018	0.012 0.006	WALKER	64	KVUE	
U 1R2•		0.005 OR LESS		LUTJENS	64	KVUE	NO INTERFERE
U 1R2•	42	0.006 - 0.002 OR GREATER		HUWE	64	HBC	- INTEFERE
U 1R2•	42	0.11 + 0.01 OR LESS		HUWE	64	HBC	+ INTERFERE
U 1R2•		0.05 OR LESS		KRAEMER	64	DBC	
U 1R2•		0.04 OR GREATER		BATON	65	HBC	
U 1R2		0.029	0.011 0.009	FLATTE	65	HBC	COHERENCE
U 1R2		0.082	0.020	FLATTE	65	HBC	INCOHER
U 1R2•		0.035 OR LESS		MILLER D C	65	HBC	
U 1R2•		0.01 OR LESS		CLARK		SPRK	NO INTERFERE
U 1R3•	OMEGA INTO (PI+PI-PIO)/(PIO GAMMA)						(P1)/(P4)
U 1R3•		8.0 +-1.5 OR LESS		BARMIN	64	PXBC	
U 1R3		10.0 3.0		BELYAKOV	64	PXBC	
U 1R4•	OMEGA INTO (PI+ PI- GAMMA)/(PI+ PI- PIO)						(P3)/(P1)
U 1R4•		0.05 OR LESS		FLATTE	65	HBC	
U 1R5•	OMEGA INTO(E+ E-)/(PI+ PI- PIO) (UNITS 10••-3)						(P7)/(P1)
U 1R5•	3	10.0 OR LESS		MURRAY	63	HBC	
U 1R5•		3.9 1.5 OR LESS		BARMIN	63	PBC	
U 1R5•	1	2.8 OR LESS		BEZAGUET	64	FBC	
U 1R5•		1.4 OR LESS		GALTIERI	65	HBC	
U 1R5	0	0.1 0.12 0.08		ZDANIS	65	SPRK	
U 1R6•	OMEGA INTO (MU+ MU-)/(PI+ PI- PIO)(UNITS 10••-3) (P6)/(P1)						
U 1R6•		1.2 OR LESS		GALTIERI	65	HBC	
U 1R6•	0	1.0 OR LESS		ZDANIS	65	SPRK	
U 1R7•	OMEGA INTO (2PIO GAMM)/(PIO GAMMA)						(P5)/(P4)
U 1R7•		0.1 OR LESS		BARMIN	64	PXBC	
U 1R8•	OMEGA INTO(ETA PIO +ETA GAM)/(PI+PI-PIO)						(P8+P9)/(P1)
U 1R8•		0.017 OR LESS		FLATTE	65	HBC	

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2 X O (960,JPG=0-+) I=0

2 X O MASS (MEV)

U 2M		958.0		GOLDBERG 1	64	HBC
U 2M	81	959.0	2.0	KALBFLEISCH	64	HBC
U 2M	89	960.0	5.0	GOLDBERG 2	64	HBC
U 2M	85	957.0		DAUBER	64	HBC
U 2M		957.0	3.0	BADIER	65	HBC

2 X O WIDTH (MEV)

U 2W •	81	12.0 OR LESS	KALBFLEISCH	64	HBC
U 2W •	89	20.0 OR LESS	GOLDBERG 2	64	HBC
U 2W •	85	4.0 OR LESS	DAUBER	64	HBC
U 2W •		LESS THAN 30.0	BADIER	65	HBC

2 X O PARTIAL DECAY MODES

U 2P1	X O INTO PI+ PI- ETA	S 8S 8S14
U 2P2	X O INTO PI+ PI- GAMMA	S 8S 8S 0
U 2P3	X O INTO PIO PIO ETA	S 9S 9S14

2 X O BRANCHING RATIOS

U 2R1•	X O INTO (PI+ PI- ETA)/TOTAL						(P1)/TOTAL
U 2R1	112	0.48	0.05	KALBFLEISCH	64	HBC	
U 2R1	72	0.5	0.1	GOLDBERG	64	HBC	
U 2R2•	X O INTO (PI+PI- ETA NEUT)/TOTAL						
U 2R2	68	0.36	0.05	KALBFLEISH+	64	HBC	
U 2R2	28	0.4	0.1	GOLDBERG 3	64	HBC	
U 2R3•	XO INTO (PI+ PI- GAMMA)/TOTAL						(P2)/TOTAL
U 2R3	42	0.22	0.04	KALBFLEISH+	64	HBC	
U 2R3		0.34	0.09	BADIER	65	HBC	
U 2R4•	X O INTO (PI+ PI- GAMMA)/(PI PI ETA)						(P2)/(P1+P3)
U 2R4•	24	0.20 APPROX.		GOLDBERG 3	64	HBC	
U 2R4		0.25	0.14	DAUBER	64	HBC	
U 2R5•	X O INTO (PI+ PI- ETA CHAR.)/TOTAL						
U 2R5		0.07	0.04	BADIER	65	HBC	
U 2R6•	X O INTO NEUTRALS/TOTAL						
U 2R6•		0.24	0.17	BADIER	65	HBC	

3 K1 K1 (1020,JPG=EVEN++) I=0

K_1K_1

K1 K1 MAYBE JUST LARGE KK SCATTERING LENGTH

3 K1 K1 MASS (MEV)

U 3M •	16	1020.0		ALEXANDER	62	HBC
U 3M •		1000.0	APPROX	BINGHAM	62	PBC
U 3M •		1000.0	APPROX	BIGI	62	HBC
U 3M •	30	1030.0	APPROX.	BALTAY	64	HBC

3 K1K1 DECAY MODES AND BRANC. RATIOS SEE TEXT

REFERENCES ON MESON RESONANCES

IDENTIFIC.	YR	AUTHORS	JOUR.VOL PAGE YR INSTITUTION	COD
ω		1 OMEGA (780,JPG=1--) I=0		
MAGLIC	61 HBC	B C MAGLIC +	PRL 7 178 61 L R L	U 1
BUTTON	61 HBC	J BUTTON +	UCRL 9814 61 L R L	U 1
XUONG	61 HBC	N H XUONG +	PRL 7 327 61 I,J,P	U 1
PEVSNER	61 HBC	A PEVSNER +	PRL 7 421 61 HOPKINS+N-WST	U 1
ALFF	62 HBC	C ALFF +	PRL 9 325 62 COLUMBIA+RUTG	U 1
ARMENTEROS	62 HBC	R ARMENTEROS +	CERN 90 62 CERN+CF+EP	U 1
STEVENSON	62 HBC	M L STEVENSON	PR 125 687 62 I,J,P	U 1
ALITTI	63 HBC	J ALITTI +	NC 29 515 63 SAC+ORS+BA+BO	U 1
ARMENTEROS	63 HBC	R ARMENTEROS +	SIENA 1 296 63 CERN+CF	U 1
BARMIN	63 PBC	V V BARMIN +	SIENA 1 207 63 ITEP	U 1
BERTHELOT	63 KVUE	A BERTHELOT	SIENA 2 60 63 KVUE	U 1
BUSCHBECK-C	263 HBC	B BUSCHBECK-CZAPP +	SIENA 1 166 63 VIENNA+CERN+AMS	U 1
FICKINGER	63 HBC	FICKINGER,ROBINSON,SALAN	PRL 10 457 63 B N L	U 1
GELFAND	63 HBC	N GELFAND +	PRL 11 436 63 COLUMBIA+RUTG	U 1
JAMES	63 HBC	JAMES,H L KRAYBILL	PREPRINT 63 YALE	U 1
MURRAY	63 HBC	J J MURRAY +	PL 7 358 63 L R L	U 1
SHAFER	63 HBC	J BUTTON-SHAFER +	STANFORD 63 L K L	U 1
BARMIN	64 PXBC	BARMIN,DOLGOLENKO +	JETP 18 1289 64 ITEP	U 1
BELYAKOV	64 PXBC	BELYAKOV +	DUBNA 64 DUBNA+BUCAREST	U 1
BEZAGUET	64 FBC	BEZAGUET,NGUYEN-KHAC +	PL 12 70 64 EP+BERGEN+UCL	U 1
HUWE	64 HBC	D D HUWE	UCRL 11291 64 L R L	U 1
LUTJENS	64 RVUE	G LUTJENS,STEINBERGER	PRL 12 517 64 COLUMBIA	U 1
KRAEMER	64 DBC	KRAEMER,FIELDS,TOOHIG +	PR 136 B496 64 JHU,N-WES,WO COLU	U 1
WALKER	64 HBC	W D WALKER +	PL 8 208 64 WISCONSIN	U 1
BEZAGUET	64 FBC	BEZAGUET,NGUYEN-KHAC +	PL 12 70 64 EP+BERGEN+UCL	U 1
BATON	65 HBC	BATON,BERTHELOT,DELER +	NC 35 713 65 SAC,ORS,BA,BO	U 1
CLARK	65 SPRK	CLARK,CHRISTENSUN, +	PREPRINT PRINCETON	U 1
FLATTE	65 HBC	FLATTE,HUWE,MURRAY +	PRL 14 1095 65 L R L	U 1
GALTIERI	65 HBC	BARBARO-GALTIERI,TRIPP	PRL 14 279 65 L R L	U 1
MILLER D C	65 HBC	D C MILLER	THESIS NE-131 65 COLUMBIA	U 1
ZDANIS	65 SPRK	ZDANIS,MADANSKY,KRAEMER+	PRL 14 721 65 JOHNS HOP.+BNL	U 1
X°		2 X O (960,JPG= +) I=0,1		
GOLDBERG 1	64 HBC	M GOLDBERG +	BAPS 9 23 64 BNL+SYR	U 2
KALBFLEISCH	64 HBC	G R KALBFLEISCH +	PRL 12 527 64 L R L	U 2
GOLDBERG 2	64 HBC	M GOLDBERG +	PRL 12 546 64 BNL+SYR	U 2
KALBFLEISCH	64 HBC	G R KALBFLEISCH +	DUBNA 64 L R L	U 2
DAUBER	64 HBC	P. M. DAUBER +	PRL 13 449 64 U C L A	U 2
GOLDBERG 3	64 HBC	GOLDBERG,GUNDZIG +	PRL 13 249 64 SYR +BNL	U 2
KALBFLEISH+	64 HBC	KALBFLEISCH,DAHL +	PRL 13 349A 64 L R L (JP)	U 2
BADIER	65 HBC	BADIER,DEMOULIN+	PL 17 337 65 EP,SACLAY,AMS	U 2
K_1K_1		3 K1,K1 (1020,EVEN++) I=0		
ALEXANDER	62 HBC	G ALEXANDER +	PRL 9 460 62 L R L	U 3
BIGI	62 HBC	A BIGI +	CERN 247 62 CERN	U 3
BINGHAM	62 PBC	H H BINGHAM +	CERN 240 62 EP+CERN	U 3
ERWIN	62 HBC	A R ERWIN +	PRL 9 34 62 WISCONSIN	U 3
BALTAY	64 HBC	BALTAY,LACH,SANDWEISS +	DUBNA 64 YALE,BNL	U 3

DATA ON MESON RESONANCES Cont'd.

CODE EVENT QUANTITY ERROR+ ERROR- REFERENCE YR TECH SIGN
IN PEAK

• INDICATES DATA IGNORED BY PROGRAMS

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4 PHI (1020,JPG=1--) I=0

4 PHI MASS (MEV)

U 4M	34	1019.0	2.0		SCHLEIN	63	HBC
U 4M	19	1018.6	0.5		GELFAND	63	HBC
U 4M		1017.0	2.0		ARMENTEROS	63	HBC
U 4M	85	1020.5	0.5		CONNOLLY 2	63	HBC

4 PHI WIDTH (MEV)

U 4W •	34	5.0	OR LESS		SCHLEIN	63	HBC
U 4W •	19	3.1	1.0		GELFAND	63	HBC
U 4W	85	3.1	0.8		CONNOLLY 2	63	HBC
U 4W		3.4	1.7		ARMENTEROS	63	HBC
U 4W		3.5	0.1		MILLER D C	65	HBC

4 PHI PARTIAL DECAY MODES

U 4P1	PHI INTO K+ K-		S10S10
U 4P2	PHI INTO K01 K02		S11S11
U 4P3	PHI INTO RHO PI		U 9S 8
U 4P4	PHI INTO PI+ PI-		S 8S 8
U 4P5	PHI INTO E+ E-		S 3S 3
U 4P6	PHI INTO MU+ MU-		S 4S 4
U 4P7	PHI INTO PIO GAMMA		S 9S 0
U 4P8	PHI INTO ETA GAMMA		S14S 0
U 4P9	PHI INTO PI+PI-GAMMA		S 8S 8S 0
U 4P1 0	PHI INTO OMEGA GAMMA		U 1S 0
U 4P1 1	PHI INTO ETA+PIO		S14S 9
U 4P1 2	PHI INTO PI+ PI- PIO		S 8S 8S 9

4 PHI BRANCHING RATIOS

U 4R1•	PHI INTO (K1 K2)/(K1 K2 AND K+ K-)						(P2)/(P1+P2)
U 4R1	10	0.40	0.10		SCHLEIN	63	HBC
U 4R1	26	0.41	0.07		LAI	64	HBC
U 4R2•	PHI INTO (RHO PI)/(K KBAR)						(P3)/(P1+P2)
U 4R2		0.1	0.1		LAI	64	HBC
U 4R3•	PHI INTO (PI+ PI-)/(K KBAR)						(P4)/(P1+P2)
U 4R3•		0.08	OR LESS		CONNOLLY 2	63	HBC
U 4R4•	PHI INTO (E+ E-)/(K KBAR)						(P5)/(P1+P2)
U 4R4•		0.0036	OR LESS		GALTIERI	65	HBC
U 4R5•	PHI INTO (MU+ MU-)/(K KBAR)						(P6)/(P1+P2)
U 4R5•		0.0053	OR LESS		GALTIERI	65	HBC
U 4R6•	PHI INTO (PI+PI-GAM)/(K KBAR)						(P9)/(P1+P2)
U 4R6•		0.05	OR LESS		LINDSEY 2	65	HBC
U 4R7•	PHI INTO (OMEGA GAM)/(K KBAR)						(P10)/(P1+P2)
U 4R7•		0.09	OR LESS		LINDSEY 2	65	HBC
U 4R8•	PHI INTO (ETA+NEUT)/(K KBAR)						(P4+P11)/(P1+P2)
U 4R8•		0.15	OR LESS		LINDSEY 2	65	HBC
U 4R9•	PHI INTO (K+ K-)/TOTAL						(P1)/TOTAL
U 4R9		0.26	0.06		BADIER	65	HBC
U 4R9		0.46	0.04		LINDSEY 1	65	HBC
U 4R1•0	PHI INTO (K1 K2)/TOTAL						(P2)/TOTAL
U 4R1 0		0.23	0.06		BADIER	65	HBC
U 4R1 0		0.37	0.04		LINDSEY 1	65	HBC
U 4R1•1	PHI INTO (PI+ PI- PIO)/TOTAL						(P12)/TOTAL
U 4R1 1		0.51	0.09		BADIER	65	HBC
U 4R1•2	PHI INTO (RHO PI)/TOTAL						(P3)/TOTAL
U 4R1 2		0.18	0.08		LINDSEY 1	65	HBC

f

5 F (1250,JPG=2++) I=0

5 F MASS (MEV)

U 5M		1250.0	25.0		SELOVE	62	HBC
U 5M		1260.0	35.0		VEILLET	63	FBC
U 5M	65	1250.0			GUIRAGOSSIAN	63	HBC
U 5M	85	1260.0			BONDAR	63	HBC
U 5M		1250.0			LEE	64	HBC

5 F WIDTH (MEV)

U 5W		100.0	25.0		SELOVE	62	HBC
U 5W •		200.	OR LESS		VEILLET	63	FBC
U 5W	85	160.0			BONDAR	63	HBC
U 5W		130.0	20.0		LEE	64	HBC

5 F PARTIAL DECAY MODES

U 5P1	F INTO PI+ PI-		S 8S 8
U 5P2	F INTO 2PI+ 2PI-		S 8S 8S 8S 8
U 5P3	F INTO K KBAR		S12S12

5 F BRANCHING RATIOS

U 5R1•	F INTO (4PI)/(2PI)						(P2)/(P1)
U 5R1		0.08	0.06		BONDAR	63	HBC
U 5R1•		0.04	OR LESS		CHUNG	65	HBC
U 5R2•	F INTO (K KBAR)/(PI PI)						(P3)/(P1)
U 5R2•		0.16	OR LESS		WANGLER	64	HBC
U 5R2•		0.04	OR LESS		CHUNG	65	HBC

E

6 E MESON (1410,JPG=) I=0,1

6 E MESON MASS (MEV)

U 6M		1410.0			ARMENTEROS	63	HBC 0
U 6M		1420.0	10.		MILLER D	65	HBC

6 E MESON WIDTH (MEV)

U 6W		60.0			ARMENTEROS	63	HBC 0
U 6W		60.0	10.0		MILLER D	65	HBC

7 SIGMA MESON (390,JPG=) I=0
EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE
PROBABLY 0(0++)

σ

7 SIGMA MESON MASS (MEV)

U 7M	173	395.0	10.0		SAMIOS	62	HBC
U 7M		390.0			KIRZ	63	HBC
U 7M		379.0	4.0		DEL FABBRO	64	SPRK
U 7M •		392.0	9.0	VIA ETA	CRAWFORD	64	HBC BROWN-SINGER MODEL
U 7M •1600		337.0	4.0	VIA TAU	PRIME KALMUS	64	PBC BROWN-SINGER MODEL
U 7M •		395.0	17.0	9.0	BROWN	65	RVUE BROWN-SINGER MODEL

7 SIGMA MESON WIDTH (MEV)

U 7W	173	50.0	20.0		SAMIOS	62	HBC
U 7W		80.0			KIRZ	63	HBC
U 7W		139.0	13.0		DEL FABBRO	64	SPRK
U 7W •		88.0	15.0	VIA ETA	CRAWFORD	64	HBC BROWN-SINGER MODEL
U 7W •1800		87.0	9.0	VIA TAU	PRIME KALMUS	64	PBC BROWN-SINGER MODEL
U 7W •		100.0	21.0	17.0	BROWN	65	RVUE BROWN-SINGER MODEL

D

8 D MESON (1285,JPG=) I=0
IGJP=0+1+,0+2- OR 0+0- SUGGESTED

8 D MESON MASS (MEV)

U 8M		1280.0	10.0		MILLER D H	65	HBC
U 8M		1290.0	8.0		D.ANDLAU	65	HBC

8 D MESON WIDTH (MEV)

U 8W		40.0	10.0		MILLER D H	65	HBC
U 8W •		25.0	APPROX.		D.ANDLAU	65	HBC

8 D MESON PARTIAL DECAY MODES

U 8P1	D MESON INTO K KBAR PI	S10S12S 8

f'(1500)

13 F PRIME (1500,JPG=2++) I=0

13 F PRIME(1500) MASS (MEV)

U13M		1500.0			BARNES	65	HBC

13 F PRIME(1500) WIDTH (MEV)

U13W •		80.0	APPROX.		BARNES	65	HBC

13 F PRIME(1500) PARTIAL DECAY MODES

U13P1	F PRIME(1500) INTO K1 K1	S12S12
U13P2	F PRIME(1500) INTO K K•(890)	S11U18

So(ππ)

14 S0 (PI PI) (700,JPG=0++) I=0
EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

14 S0 (PI PI) (700) MASS (MEV)

U14M		700.0			FELDMAN	65	SPRK
U14M		720.0			HAGOPIAN	65	HBC

14 S0 (PI PI) (700) WIDTH (MEV)

U14W		50.0			FELDMAN	65	SPRK
U14W		50.0			HAGOPIAN	65	HBC

REFERENCES ON MESON RESONANCES Cont'd.

IDENTIFIC.	YR	AUTHORS	JOUR.VOL	PAGE	YR	INSTITUTION	COD

Φ

4 PHI (1020,JPG=1--) I=0

BERTANZA	62	HBC	L BERTANZA +	PRL	9	180	62	H N L U 4
ARMENTEROS	63	HBC	QUOTED BY BERTHELOT	SIENA	2	70	63	CERN+CDF U 4
CONNOLLY 1	63	HBC	P L CONNOLLY +	PRL	10	371	63	B N L U 4
CONNOLLY 2	63	HBC	P L CONNOLLY +	SIENA	1	130	63	BNL+SYR U 4
GELFAND	63	HBC	N GELFAND +	PRL	11	438	63	COLUMBIA+RUTG U 4
SCHLEIN	63	HBC	P SCHLEIN +	PRL	10	368	63	UCLA U 4
LAI	64	HBC	K W LAI +	dAPS	9	22	64	BNL+SYR U 4
GALTIERI	64	HBC	BARBARO-GALTIERI,TRIPP	PRL	14	279	65	L R L U 4
LINDSEY 2	65	HBC	LINDSEY,SMITH	PRL	15	221	65	L R L U 4
LINDSEY 1	65	HBC	LINDSEY,SMITH	BAPS	10	502	65	L R L U 4
BADIER	65	HBC	BADIER,DEMOULIN+	PL	17	337	65	EP,SACLAY,AMS U 4
MILLER D C	65	HBC	D C MILLER	THESIS		No 131	65	COLUMBIA U 4

QUANTUM NUMBERS DETERMINATIONS NOT REFERRED TO IN DATA CARDS

CONNOLLY	63	HBC	P L CONNOLLY +	SIENA	130	63	BNL+SYR	U 4

f

5 F (1250,JPG=2++) I=0

SELOVE	62	HBC	W SELOVE +	PRL	9	277	62	PEN+BNL U 5
BONDAR	63	HBC	L BONDAR +	PL	5	153	63	AACHEN+ U 5
GUIRAGOSSIAN	63	HBC	Z G T GUIRAGOSSIAN	PRL	11	85	63	L R L U 5
VEILLET	63	FBC	J J VEILLET +	PRL	10	29	63	LP+MILAN U 5
LEE	64	HBC	Y Y LEE +	PRL	12	342	64	MICHIGAN U 5
WANGLER	64	HBC	WANGLER	THESIS			64	WISCONSIN U 5
CHUNG	65	HBC	CHUNG,DAHL,HARDY,HESS	PRL	15	325	65	L R L U 5

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS

HAGOPIAN	63	HBC	V HAGOPIAN,W SELOVE	PRL	10	533	63	1,J U 5
ADERHOLZ	64	HBC	M ADERHOLZ +(AACHEN+)	PL	10	240		I U 5
BRUYANT	64	OBC	BRUYANT,GOLDBERG +	PL	10	232	64	I U 5
SODICKSON	64	SPCH	L SODICKSON +	PRL	12	485	64	I U 5

E

6 E MESON (1410,JPG=) I=0,1

ARMENTEROS	63	HBC	R ARMENTEROS +	SIENA	207	63	CERN+CDF	U 6
HESS	64	HBC	R I HESS +	DUBNA		64	LRL	U 6
MILLER D	65	HBC	MILLER,CHUNG,DAHL,HESS +	PRL	14 1074	65	L R L	U 6

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7 SIGMA MESON (390,JPG=) I=0

SAMIOS	62	HBC	N P SAMIOS +	PRL	9	139	62	BNL+CCNY+CO+KY U 7
KIRZ	63	HBC	KIRZ,SCHWARTZ,TRIPP	PR	130	2481	63	L R L U 7
CRAWFORD	64	HBC	F S CRAWFORD +	PRL	13	421	64	L R L U 7
DEL FABBRO	64	SPRK	R DEL FABBRO +	PRL	12	674	64	FRASCATI U 7
KALMUS	64	PBC	G E KALMUS +	SUMM. PR	JUNE		64	WISCONSIN+LRL U 7
BROWN	65	RVUE	BROWN,FAIER	CURAL GAB.			65	NORTH-WES U 7

D

8 D MESON (1285,JPG=) I=0

MILLER D H	65	HBC	MILLER,DAHL,HARDY,HESS +	PRL	14	1074	65	L R L U 8

f'(1500)

13 F• (1500,JPG=2++) I=0

BARNES	65	HBC	BARNES,CULWICK,GUIDONI +	PRL	15	322	65	BNL,SYRACUSE U13

So(ππ)

14 S0 (PI PI) (700,JPG=0++) I=0

FELDMAN	65	SPRK	FELDMAN,FRATI,HALPERN +	PRL	14	869	65	BNL+COLUM+PENNSTU U14
HAGOPIAN	65	HBC	HAGOPIAN,SELOVE,ALITTI +	PRL	14	1077	65	PENN+SACLAY+BOLOU U14

DATA ON MESON RESONANCES Cont'd.

CODE EVENT QUANTITY ERROR+ ERROR- REFERENCE YR TECH SIGN
IN PEAK

• INDICATES DATA IGNORED BY PROGRAMS

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9 RHO (750,JPG=1-+) I=1

9 RHO MASS (MEV)

U 9M	610	770.0	10.0		ALFF	62	HBC	+
U 9M		783.8	6.0		JAMES	64	HBC	+
U 9M	•	756.0	10.0		JAMES	64	HBC	+
U 9M	• PREV. MASS FOR MOM.TRANS. LESS THAN 2.5 MPI••2							
U 9M	•	760.0	9.0		CARMONY	64	HBC	+
U 9M	• PREV. MASS FOR MOM TRANSF LESS THAN 4 MPI••2							
U 9M		760.	10.		ARMENISE	65	HBC	+
U 9M		748.8			KENNEY	62	HBC	-
U 9M		765.0	10.0		ERWIN	63	HBC	-
U 9M	130	775.0			GUIRAGOSSIAN	63	HBC	-
U 9M		765.0	30.0		LEE	64	HBC	-
U 9M	290	755.0			CHADWICK	63	HBC	+-0
U 9M		740.0			WALKER	62	HBC	-0
U 9M	240	752.0			ALITTI	63	HBC	-0
U 9M		765.0			LEE	65	HBC	-0
U 9M	300	750.0	10.0		ALFF	62	HBC	0
U 9M	190	750.0	20.0		SAMIOS	62	HBC	0
U 9M	300	760.0	10.0		ABOLINS	63	HBC	0
U 9M		763.0	10.0		ERWIN	63	HBC	0
U 9M	160	775.0			GUIRAGOSSIAN	63	HBC	0
U 9M	500	770.0	10.0		GOLDHABER	64	HBC	0
U 9M		765.0	15.0		LEE	64	HBC	0
U 9M		750.0			CLARK	65	SPRK	0
U 9M		740.0	10.0		LANZEROTTI	65	CNTR	0

9 RHO WIDTH (MEV)

U 9W	610	130.0	10.0		ALFF	62	HBC	+
U 9W		90.0	10.0		SACLAY	63	HBC	+
U 9W		177.0	15.0		JAMES	64	HBC	+
U 9W	•	146.0	20.0		JAMES	64	HBC	+
U 9W	• PREV.WIDTH FOR MOM.TRANS. LESS THAN 2.5 MPI••2							
U 9W	•	77.0	20.0		CARMONY	64	HBC	+
U 9W	• PREV.WIDTH FOR MOM TRANSF LESS THAN 4 MPI••2							
U 9W		160.	10.		ARMENISE	65	HBC	+
U 9W		65.0	20.0		ERWIN	63	HBC	-
U 9W	130	125.0			GUIRAGOSSIAN	63	HBC	-
U 9W	98	180.0			BONDAR	64	HBC	-
U 9W	290	110.0			CHADWICK	63	HBC	+-0
U 9W		120.0			WALKER	62	HBC	-0
U 9W		125.0	15.		LEE	65	HBC	-0
U 9W	300	100.0	10.0		ALFF	62	HBC	0
U 9W	190	150.0	20.0		SAMIOS	62	HBC	0
U 9W	300	90.0	10.0		ABOLINS	63	HBC	0
U 9W		165.0	20.0		ERWIN	63	HBC	0
U 9W	160	175.0			GUIRAGOSSIAN	63	HBC	0
U 9W	96	210.0			BONDAR	64	HBC	0
U 9W	500	130.0			GOLDHABER	64	HBC	0
U 9W		130.0			CLARK	65	SPRK	0
U 9W		150.0	10.0		LANZEROTTI	65	CNTR	0

9 RHO PARTIAL DECAY MODES

U 9P1	RHO INTO 2PI	S 8S 8	
U 9P2	RHO INTO 4PI	S 8S 8S 8S 8	
U 9P3	RHO INTO PI GAMMA	S 8S 0	
U 9P4	RHO INTO E+ E-	S 3S 3	

9 RHO BRANCHING RATIOS

U 9R1•	RHO INTO 4PI/2PI				(P2)/(P1)
U 9R1•	0.05 OR LESS	XUONG	62	HBC	
U 9R2•	RHO INTO PI GAMMA/2PI				(P3)/(P1)
U 9R2•	0.02 OR LESS	DAUDIN	64	HBC	+
U 9R3•	RHO INTO(E+ E-)/(PI+PI-)	(UN 10••-4)			(P4)/(P1)
U 9R3	0 0.65 0.8 0.4	ZDANIS	65	SPRK	

A1

10 A1 MESON (1200,JPG= -1 I=1

10 A1 MESON MASS (MEV)

U1OM		1080.0	20.0		ALLARD	64	FBC	-
U1OM		1080.0	10.0		HESS	64	HBC	-
U1OM		1030.0	20.0		DEUTSCHMANN	64	HBC	+
U1OM		1080.0			ADERHOLZ	64	HBC	

10 A1 MESON WIDTH (MEV)

U1OW	•	100.0	APPROX		HESS	64	HBC	-
U1OW	•	150.0	APPROX		ALLARD	64	FBC	-
U1OW		80.0			ADERHOLZ	64	HBC	

10 A1 PARTIAL DECAY MODES

U1OP1	A1 INTO RHO PI	U 9S 8
U1OP2	A1 INTO KBAR K	S10S11

10 A1 BRANCHING RATIOS

U1OR1•	A1 INTO (KBAR K)/(RHO PI)				(P2)/(P1)
U1OR1•	0.05 OR LESS	CHUNG	64	HBC	

B

11 B MESON (1220,JPG= +) I=1

11 B MESON MASS (MEV)

U11M	60	1220.0			ABLINS	63	HBC	+
U11M		1220.0			HESS	64	HBC	-
U11M		1220.0			GOLDHABER	65	HBC	

11 B MESON WIDTH (MEV)

U11W	60	180.0	20.0		ABOLINS	63	HBC	+
U11W		180.0	30.0		HESS	64	HBC	-
U11W		80.0			GOLDHABER	65	HBC	

11 B MESON PARTIAL DECAY MODES

U11P1	B MESON INTO OMEGA+PI	U 1S 8
U11P2	B MESON INTO 2PI+ 2PI-	S 8S 8S 8S 8
U11P3	B MESON INTO K KBAR	S10S10
U11P4	B MESON INTO PI PI	S 8S 8

11 B MESON BRANCHING RATIOS

U11R1•	B INTO 4PI/(OMEGA PI)				(P2)/(P1)
U11R1•	0.5 OR LESS	ABOLINS	63	HBC	+
U11R2•	B MESON INTO (K KBAR)/(OMEGA PI)				(P3)/(P1)
U11R2•	0.10 OR LESS	HESS	64	HBC	
U11R2•	B MESON INTO(PI PI)/(PI OMEGA)				(P4)/(P1)
U11R2•	0.3 OR LESS	ADERHOLZ	64	HBC	

A2

12 A2 MESON (1310,JPG=2+-) I=1

12 A2 MESON MASS (MEV)

U12M	70	1310.0			CHUNG	64	HBC	-
U12M		1320.0			ADERHOLZ	64	HBC	
U12M		1335.0	10.0		GOLDHABER	64	HBC	
U12M		1280.0	20.0		DEUTSCHMANN	64	HBC	+

12 A2 MESON WIDTH (MEV)

U12W	70	80.0			CHUNG	64	HBC	-
U12W		100.0			ADERHOLZ	64	HBC	
U12W		90.0	10.0		GOLDHABER	64	HBC	

12 A2 MESON PARTIAL DECAY MODES

U12P1	A2 MESON INTO RHO PI	U 9S 8
U12P2	A2 MESON INTO KBAR K	S10S12
U12P3	A2 MESON INTO ETA PI	S14S 8
U12P4	A2 INTO XO PI	U 2S 8

12 A2 MESON BRANCHING RATIOS

U12R1•	A2 MESON INTO (K K)/(RHO PI)							(P2)/(P1)
U12R1•	0.04 OR LESS				ARMENTEROS	65	HBC	-
U12R2•	A2 MESON INTO (ETA PI)/TOTAL							(P3)/TOTAL
U12R2	0.00	0.03			DEUTSCHMANN	64	HBC	
U12R2	0.3	0.2			ADERHOLZ	65	HBC	
U12R2•	25 0.2	APPROX.			TRILLING	65	HBC	
U12R2	0.03	0.03			CHUNG	65	HBC	-
U12R3•	A2 MESON INTO (RHO PI)/TOTAL							(P1)/TOTAL
U12R3	0.91	0.04	0.10		CHUNG	65	HBC	-
U12R4•	A2 MESON INTO (XO PI)/TOTAL							(P4)/TOTAL
U12R4•	0.1 OR LESS				CHUNG	65	HBC	-
U12R5•	A2 MESON INTO (KBAR K)/TOTAL							
U12R5	0.055	0.015			CHUNG	65	HBC	-

REFERENCES ON MESON RESONANCES Cont'd.

IDENTIFIC.	YR	AUTHORS	JOUR.	VOL	PAGE	YR	INSTITUTION	COD
ρ		9 RHO (750,JPG=1-+) I=1						
ANDERSON	61	HBC J A ANDERSON +	PRL	6	365	61	L R L	U 9
ALFF	62	HBC C ALFF +	PRL	9	322	62	COL.+RUTG	U 9
KENNEY	62	HBC V P KENNEY +	PR	126	736	62	KENTUCKY UN.	U 9
SAMIOS	62	HBC N P SAMIOS +	PRL	9	139	62	BNL+CCNY+CO+KY	U 9
WALKER	62	HBC W D WALKER +	CERN		42	62	WISCONSIN	U 9
XUONG	62	HBC N XUONG,G R LYNCH	PR	128	1849	62	L R L	U 9
ABOLINS	63	HBC M ABOLINS +	PRL	11	381	63	UCSD	U 9
ALITTI	63	HBC J ALITTI +	NC	29	515	63	SAC+ORS+BA+BO	U 9
CHADWICK	63	HBC G B CHADWICK +	PRL	10	62	63	OXFURD + PADOVA	U 9
GUIRAGOSSIAN	63	HBC ZGT GUIRAGOSSIAN	PRL	11	85	63	L R L	U 9
ERWIN	63	HBC ERWIN,SATTERBLOM,WALKER+SIENA		112	63		WISCONSIN	U 9
SACLAY	63	HBC SACLAY,ORSAY,BARI,BOLOG SIENA		239	63		SAC,ORS,BA,BO	U 9
BATON	64	HBC BATON,BERTHELOT,DELER +	NC	35	713	64	SAC+ORS+BA+BO	U 9
BONDAR	64	HBC L BONDAR +	NC	31	729	64	AAC,BI,BO,HA,IC+	U 9
GOLDHABER	64	HBC G GOLDHABER +	PRL	12	336	64	L R L	U 9
CARMONY	64	HBC D D CARMONY +	DUBNA	64		64	UCSD	U 9
DAUDIN	64	HBC A.DAUDIN +	PREPRINT			64	SACLAY,BARI	U 9
JAMES	64	HBC F.E.JAMES+ M.L.KRAYBILL	DUBNA			64	YALE	U 9
LEE	64	HBC LEE,ROE,SINCLAIR +	PRL	12	342	64	MICHIGAN	U 9
ARMENISE	65	HBC ARMENISE,CHIDINI +	NC	37	361	65	SAC+ORS+BARI+BOLU	9
CLARK	65	SPRK CLARK,CHRISTENSON, +	PREPRINT				PRINCETON	U 9
LANZEROTTI	65	CNTR LANZEROTTI,BLUMENTHAL +	PRL	15	210	65	HARVARD	U 9
LEE	65	HBC LEE,YAM.	MICH	0493881		64	MICHIGAN	U 9
ZDANIS	65	SPRK ZDANIS,MADANSKY,KRAEMER+	PRL	14	721	65	JOHNS HOP.+BNL	U 9
		EVIDENCE FOR STUCTURE WITHIN THE RHO PEAK IS OBSERVED BY						
KEEFE	64	SPRK D. KEEFE +	DUBNA			64	LRL	U 9
JONES	64	SPRK L.W.JONES+	DUBNA			64	MICH,CERN,PRINC+	U 9
	SEE ALSO							
BUTTON	62	HBC J BUTTON +	PR	126	1858	62	LRL	U 9
CALDWELL	62	SPRK U O CALDWELL +	PL	2	253	62	CERN	U 9
FOELSCHE	62	HBC H FUELSCHE +	CERN	62	36	62	YALE	U 9
		QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS						
ERWIN	61	HBC A R ERWIN +	PRL	6	628	61	I,J	U 9
PICKUP	61	HBC E PICKUP +	PRL	7	192	61	J	U 9
STONEHILL	61	HBC D L STONEHILL +	PRL	6	624	61	I,J	U 9
A1		10 A1 MESON (1200,JPG= -) I=1						
BELLINI	63	PBC G BELLINI +	NC	29	896	63	MILAN	U10
HUSON	63	PBC F R HUSON,W B FRETTER	BAPS	8	325	63	UC BERKELEY	U10
ADERHOLZ	64	HBC M ADERHOLZ +	PL	10	226	64	AACHEN+	U10
ALLARD	64	FBC J.F.ALLARD +	PL	12	143	64	EP+CERN+MIL+	U10
CHUNG	64	HBC S U CHUNG +	PRL	12	621	64	L R L	U10
DEUTSCHMANN	64	HBC M DEUTSCHMANN +	DUBNA	64		64	AACHEN+BERL+CERN	U10
DEUTSCHMANN	64	HBC M DEUTSCHMANN +	PL	12	356	64	AACHEN+BERL+CERN	U10
GOLDHABER	64	HBC G GOLDHABER +	PRL	12	336	64	L R L	U10
HESS	64	HBC R.I.HESS +	DUBNA	64		64	LRL	U10
LANDER	64	HBC R.L.LANDER +	PRL	13	346A	64	UCSD J,P	U10
ALITTI	65	HBC ALITTI,BATON,DELER +	PL	15		69	65 SAC(LPC+OSS)+BO	U10
B		11 B MESON (1220,JPG= +) I=1						
ABOLINS	63	HBC M ABOLINS +	PRL	11	381	63	UCSD	U11
BONDAR	63	HBC L BONDAR +	PL	5	209	63	AACHEN +	U11
CHUNG	63	HBC SU CHUNG +	SIENA		201	63	L R L	U11
ADERHOLZ	64	HBC ADERHOLZ +	PL	10	240	64	AA+BI,BO,HA,IC+	U11
HESS	64	HBC R.I.HESS +	DUBNA	64		64	LRL	U11
GOLDHABER	65	HBC G GOLDHABER,S GOLDHABER+	PRL	15	118	65	L R L	U11
		QUANTUM NUMBERS DETERMINATIONS NOT REFERRED TO IN DATA CARDS						
CARMONY	64	HBC D D CARMCNY +	PRL	12	254	64	UCSD J,P	U11
A2		12 A2 MESON (1310,JPG=2+-) I=1						
ADERHOLZ	64	HBC M ADERHOLZ +	PL	10	248	64	AACHEN+	U12
CHUNG	64	HBC S U CHUNG +	PRL	12	621	64	L R L J,P	U12
DEUTSCHMANN	64	HBC M DEUTSCHMANN +	PL	12	356	64	AACHEN+BERL+CERN	U12
DEUTSCHMANN	64	HBC M DEUTSCHMANN +	DUBNA	64		64	AACHEN+BERL+CERN	U12
GOLDHABER	64	HBC G GOLDHABER +	DUBNA			64	LRL	U12
HESS	64	HBC R.I.HESS +	DUBNA	64		64	LRL	U12
CHUNG	65	HBC CHUNG,DAHL,HARDY,HESS	PRL	15	325	65	L R L	U12
		QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS						
LANDER	64	HBC R.L.LANDER +	PRL	13	346A	64	UCSD J,P	U12
ADERHOLZ	65	HBC ADERHOLZ,BONDAR +	TO BE PUB.			65	AACHEN +	U12
TRILLING	65	HBC TRILLING,BROWN,GOLDHABER	TO BE PUB.			65	L R L	U12

DATA ON MESON RESONANCES Concluded

CODE EVENT QUANTITY ERROR+ ERROR- REFERENCE YR TECH SIGN IN PEAK

* INDICATES DATA IGNORED BY PROGRAMS

$\pi^+\pi^-$ (1670)

15 PI+PI- (1670,JPC=) I=1 OR LESS

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

15 PI+PI-(1670) MASS (MEV)

U15M		1670.0	30.0	GOLDBERG	65	HBC

15 PI+PI-(1670) WIDTH (MEV)

U15W		180.0	40.0	GOLDBERG	65	HBC

$K\bar{K}$(1025)

16 KKBAR (1025,JPC=) I=1

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

16 KKBAR(1025) MASS (MEV)

U16M	*	1025.0	APPROX.	ARMENTEROS	65	HBC

16 KKBAR(1025) WIDTH (MEV)

U16W	*	40.0	APPROX.	ARMENTEROS	65	HBC

K

17 KAPPA (725,J =) I=1/2

17 KAPPA MASS (MEV)

U17M		730.0		ALEXANDER	62	HBC	+ 0
U17M	92	726.0	3.0	MILLER	63	HBC	+ 0
U17M	33	723.0	3.0	WOJCICKI	63	HBC	-
U17M		725.0		CONNOLLY	63	HBC	
U17M		725.0	5.0	FERRO-LUZZI	64	HBC	+ 0

17 KAPPA WIDTH (MEV)

U17W	* 92	20.0 OR LESS		MILLER	63	HBC	+ 0
U17W	* 33	12.0 OR LESS		WOJCICKI	63	HBC	-
U17W	*	LESS THAN 30.		FERRO-LUZZI	64	HBC	+ 0

17 KAPPA PARTIAL DECAY MODES

U17P1	KAPPA INTO K PI		S10S 8

K^*

18 K* (890,JP =1-) I=1/2

18 K* MASS (MEV)

U18M		898.0	5.0	CHADWICK	63	HBC	+
U18M		891.0	3.0	FERRO-LUZZI	65	HBC	+
U18M		890.5		ARMENTEROS	65	HBC	+-
U18M	3870	891.0	1.0	WOJCICKI	63	HBC	-
U18M		891.0	3.0	GELSEMA	64	HBC	-
U18M	200	880.0		ALEXANDER	62	HBC	+ 0
U18M		885.0		ARMENTEROS	62	HBC	+-0
U18M	70	897.0	10.0	COLLEY	62	HBC	0
U18M	200	892.0	2.0	KRAEMER	63	HBC	0
U18M	150	885.0		SMITH	63	HBC	0

18 K* WIDTH (MEV)

U18W		46.0	8.0	CHADWICK	63	HBC	+
U18W		47.0	4.0	FERRO-LUZZI	65	HBC	+
U18W	3870	46.0	3.0	WOJCICKI	63	HBC	-
U18W		50.0	13.0	GELSEMA	64	HBC	-
U18W		31.0		ARMENTEROS	65	HBC	+-
U18W	200	60.0	5.0	ALEXANDER	62	HBC	+ 0
U18W		55.0		ARMENTEROS	62	HBC	+-0
U18W	70	60.0	10.0	COLLEY	62	HBC	0
U18W	150	50.0		SMITH	63	HBC	0
U18W	200	50.0	5.0	KRAEMER	63	HBC	0

18 K* PARTIAL DECAY MODES

U18P1	K* INTO K PI		S10S 8
U18P2	K* INTO K2PI		S10S 8S 8
U18P3	K* INTO KAPPA PI		U17S 8

18 K* BRANCHING RATIOS

U18R1*		K* INTO (KAPPA PI)/(K PI)				(P3)/(P1)
U18R1*	3	0.005 OR LESS		GOLDHABER	63	HBC
U18R1*	0	0.002 OR LESS		WOJCICKI+	63	HBC
U18R1*		LESS THAN 0.01		FERRO-LUZZI	64	HBC + 0

U18R2*		K* INTO (K 2PI)/(K PI)				(P2)/(P1)
U18R2*	0	0.002 OR LESS		WOJCICKI+	63	HBC

$K\pi\pi$

19 K2PI (1175,JPC=) I=

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

19 K2PI MASS (MEV)

U19M	* 23	1175.0		WANGLER	64	HBC
U19M	15	1160.0	10.0	MILLER	65	HBC PURDUE

19 K2PI WIDTH (MEV)

U19W	* 23	25.0 OR LESS		WANGLER	64	HBC
U19D	15	35.0	10.0	MILLER	65	HBC PURDUE

C

20 C MESON (1215,JPC=) I=

20 C MASS (MEV)

U20M		1215.0	15.0	ARMENTEROS	64	HBC

20 C WIDTH (MEV)

U20W		60.0	10.0	ARMENTEROS	64	HBC

20 C PARTIAL DECAY MODES

U20P1	C INTO K+- RHO-+	S10U 9
U20P2	C INTO KO RHO0	S11U 9
U20P3	C INTO K++- PI-+	U18S 8
U20P4	C INTO K+0 PI0	U18S 9
U20P5	C INTO K PI PI	S11S 8S 8

20 C BRANCHING RATIOS

U20R1*		C INTO (K+- RHO-+)/(KO RHO0)				P1/P2
U20R1*		ABOUT 0.82		ARMENTEROS	64	HBC 0
U20R2*		C INTO (K+0 PI0)/(K++- PI-+)				P3/P4
U20R2*		ABOUT 0.9		ARMENTEROS	64	HBC 0

$K^*_{3/2}$(1270)

21 K PI PI (1270,JPC=) I=3/2

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

21 K PI PI MASS (MEV)

U21M		1270.0	20.0	BOCK	64	HBC

21 K PI PI WIDTH (MEV)

U21W		60.0	30.0	BOCK	64	HBC

21 K PI PI PARTIAL DECAY MODES

U21P1	K PI PI INTO K* PI	U18S 8
U21P2	K PI PI INTO K RHO	S10U 9

K^* (1400)

22 K* (1400,JPC=) I=1/2

22 K*(1400) MASS (MEV)

U22M	21	1400.0	10.0	HAQUE	65	HBC
U22M	36	1430.0	20.0	HARGY	65	HBC
U22M		1404.0	15.0	FOCARDI	65	HBC

22 K*(1400) WIDTH (MEV)

U22W	21	160.0		HAQUE	65	HBC
U22W	36	100.0	20.0	HARDY	65	HBC
U22W		92.0	14.0	FOCARDI	65	HBC

22 K* (1400) PARTIAL DECAY MODES

U22P1	K*(1400) INTO K PI	S10S 8

$K\pi\pi$ (1320)

23 K2PI (1320,JPC=) I=1/2

23 K2PI(1320) MASS (MEV)

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

U23M		1320.0	25.0	ALMEIDA	65	HBC

23 K2PI(1320) WIDTH (MEV)

U23W		60.0	20.0	ALMEIDA	65	HBC

23 K2PI(1320) PARTIAL DECAY MODES

U23P1	K2PI(1320) INTO K*(890)+PI	U18S 8

K^+K^+(1055)

60 K+K+ (1055,JPC=) I=1 S=2

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

60 K+K+(1055) MASS (MEV)

U60M		1055.0	20.0	FERRO-LUZZI	65	HBC

60 K+K+(1055) WIDTH (MEV)

U60W		60.0	25.0	FERRO-LUZZI	65	HBC

K^+K^+(1280)

61 K+K+ (1280,JPC=) I=1 S=2

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

61 K+K+(1280) MASS (MEV)

U61M		1280.0	20.0	FERRO-LUZZI	65	HBC

61 K+K+(1280) WIDTH (MEV)

U61W		110.0	40.0	FERRO-LUZZI	65	HBC

REFERENCES ON MESON RESONANCES Concluded

IDENTIFIC. YR AUTHORS JOUR,VOL PAGE YR INSTITUTION COD

$\pi^+\pi^-$ (1670)

15 PI+PI-(1670,JPC=) I=0,1

GOLDBERG	65	HBC	GOLDBERG,JUDD,VEGNI+	PL	17	354	65	CERN+SAC+ORS+MILU15	

$K\bar{K}$(1025)

16 KKBAR(1025,JPC=) I=1

ARMENTEROS	65	HBC	ARMENTEROS,EDWARDS+	PL	17	344	65	CERN+PARIS	U16

K

17 KAPPA (725,JP =) I=1/2

ALEXANDER	62	HBC	G ALEXANDER +	PRL	8	447	62	L R L	U17
CONNOLLY	63	HBC	P L CONNOLLY +	SIENA		125	63	BNL+SYR	U17
MILLER	63	HBC	D H MILLER +	PL	5	279	63	L R L	U17
WOJCICKI	63	HBC	S G WOJCICKI +	PL	5	283	63	L R L	U17
FERRO-LUZZI	64	HBC	M.FERRO-LUZZI +	PL	12	255	64	CERN	U17

K^*

18 K* (890,JP =1-) I=1/2

ALSTON	61	HBC	M H ALSTON +	PRL	6	300	61	L R L	U18
ALEXANDER	62	HBC	G ALEXANDER +	PRL	8	447	62	L R L	U18
ARMENTEROS	62	HBC	R ARMENTEROS +	CERN		229	62	CERN+CDF+EP	U18
COLLEY	62	HBC	D COLLEY +	CERN		315	62	COLUMBIA+RUTG	U18
CHADWICK	63	HBC	G B CHADWICK +	PL	6	309	63	OXFORD+PADOVA	U18
GOLDHABER	63	HBC	S GOLDHABER	ATHENS		92	63	L N L	U18
KRAEMER	63	HBC	R KRAEMER +	ATHENS		130	63	JOHNS HOPK.	U18
SMITH	63	HBC	G A SMITH +	PRL	10	138	63	L N L	U18
FERRO-LUZZI	64	HBC	M.FERRO-LUZZI +	PL	12	255	64	CERN	U18
GELSEMA	64	HBC	E.S.GELSEMA +	PL	10	361	64	AMSTERDAM	U18
WOJCICKI +	64	HBC	S.G.WOJCICKI +	PR	135	B495	64	LRL	U18
WOJCICKI	64	HBC	S.G.WOJCICKI	PR	135	B484	64	LRL	U18
ARMENTEROS	65	HBC	ARMENTEROS,EDWARDS+	PL	17	170	65	CERN,PARIS	U18
FERRO-LUZZI	65	HBC	FERRO-LUZZI,GEORGE+	NC	36	1101	65	CERN	U18

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS

CHINOWSKY	62	HBC	W CHINOWSKY +	PRL	9	330	62	J	U18

$K\pi\pi$

19 K2PI (1175,JPC=) I=

WANGLER	64	HBC	FP WANGLER,WALKER,ERWIN	PL	9	71	64	WISCONSIN	U19
MILLER	65	HBC	MILLER,KOVACS,MCILWAIN+	PL	15	74	65	PURDUE	U19

C

20 C MESON(1200,JPC=) I=1/2

ARMENTEROS	64	HBC	R ARMENTEROS +	PL	9	207	64	CERN+CDF	U20
ARMENTEROS	64	HBC	R ARMENTEROS +	DUBNA	64		64	CERN+CDF	U20

$K^*_{3/2}$(1270)

21 K PI PI (1270,JPC=) I=3/2

BOCK	64	HBC	R BOCK +	PL	12	65	64	CERN+EP+IMP.COLL	U21

K^* (1400)

22 K* (1400,JPC=) I=1/2

HAQUE	65	HBC	HAQUE,SCOTER +	PL	14	338	65	BI+ICL+DAF+RUTH	U22
HARDY	65	HBC	HARDY,CHUNG,DAHL,HESS +	PRL	14	401	65	L R L	U22
FOCARDI	65	HBC	FOCARDI,MINGUZZI+RANZI+	PL	16	351	65	BOL+MODENA+SACL	U22

$K\pi\pi$(1320)

23 K2PI(1320) (1320,JPC=) I=1/2

ALMEIDA	65	HBC	ALMEIDA,ATHERTON,BYER+	PL	16	184	65	CAVENDISH	U23

K^+K^+(1055)

60 K+K+ (1055,JPC=) I=1 S=2

FERRO-LUZZI	65	HBC	FERRO-LUZZI,GEORGE+	PL	17	155	65	CERN	U60

K^+K^+(1280)

61 K+K+ (1280,JPC=) I=1 S=2

FERRO-LUZZI	65	HBC	FERRO-LUZZI,GEORGE+	PL	17	155	65	CERN	U61

DATA ON BARYON RESONANCES

CODE EVENT QUANTITY ERROR+ ERROR- REFERENCE YR TECHNIQUE.
IN PEAK

• INDICATES DATA IGNORED BY PROGRAMS

$N^*_{1/2}(1480)$

24 N*1/2 (1480,JP=1/2+) I=1/2

U24 • EXISTENCE DUBIOUS

24 N*1/2(1480) MASS (MEV)

U24M •	1400.0	APPROX		COCCONI	64	CNTR
U24M •	1415.0	APPROX		BAREYRE	64	RVUE
U24M	1497.			ROPER	64	RVUE
U24M •	1425.0	APPROX		ADELMAN	64	HBC +
U24M	1512.0			AUVIL	64	RVUE
U24M	1425.0	14.0		ADELMAN	65	RVUE

24 N*1/2(1480) WIDTH (MEV)

U24W	240.0		BAREYRE	64	RVUE
U24W	260.		AUVIL	64	RVUE
U24W	58.0		ADELMAN	65	RVUE

$N^*(1512)$

25 N*1/2 (1512,JP=3/2-) I=1/2

PARITY ASSIGNMENT STILL NOT FINAL

25 N*1/2(1512) MASS (MEV)

U25M	1512.0		PEIERLS	60	RVUE
U25M	1512.0		FALK-VARIAN	61	RVUE
U25M	1512.0		MOYER	61	RVUE
U25M	1515.0		DETOEUF	61	RVUE
U25M	1518.0	10.0	BELLETTINI	63	CNTR
U25M	1534.		ROPER	64	RVUE
U25M	1525.0		AUVIL	64	RVUE
U25M	1519.0	5.0	DEVLIN	65	CNTR

25 N*1/2(1512) WIDTH (MEV)

U25W	140.0		FALK-VARIAN	61	RVUE
U25W	125.0	12.5	DETOEUF	61	RVUE
U25W •	80.0	APPROX	BELLETTINI	63	CNTR
U25W	56.		AUVIL	64	RVUE
U25W •	61.0	5.0 LOWER HALF	DEVLIN	65	CNTR
U25W •	52.0	3.0 UPPER HALF	DEVLIN	65	CNTR

25 N*1/2(1512) PARTIAL DECAY MODES

U25P1	N*1/2(1512) INTO N PI	S16S 8
U25P2	N*1/2(1512) INTO N PI PI	S16S 8S 8
U25P3	N*1/2(1512) INTO ETA N	S18S17
U25P4	N*1/2(1512) INTO N*3/2(1238)+PI	U31S08

25 N*1/2(1512) BRANCHING RATIOS

U25R1•	N*1/2(1512) INTO (N PI)/TOTAL				(P1)/TOTAL
U25R1	0.79		OMNES	61	RVUE
U25R1	0.62		DEVLIN	62	CNTR
U25R1	0.67		LAYSUN	63	RVUE
U25R1	0.71	0.08	DETOEUF	64	CNHT
U25R1	0.77	0.02	AUVIL	64	RVUE
U25R1	0.80		DEVLIN	65	CNTR
U25R2•	N*1/2(1512) INTO (ETA PI)/TOTAL				(P3)/TOTAL
U25R2•	SEEN ,NO RATIO QUOTED		BULOS	64	SPRK
U25R3•	N*1/2(1512) INTO(N*3/2(1238)+PI)/TOTAL				(P4)/TOTAL
U25R3•	SEEN ,NO RATIO QUOTED		KIRZ	63	HBC
U25R3•	SEEN ,NO RATIO QUOTED		CROUCH	65	HBC

$N^*(1688)$

26 N*1/2 (1688,JP=5/2+) I=1/2

PARITY ASSIGNMENT STILL NOT FINAL

26 N*1/2(1688) MASS (MEV)

S26M	1715.0		PEIERLS	60	RVUE
U26M	1683.0		FALK-VAIRAN	61	RVUE
U26M	1688.0		MOYER	61	RVUE
U26M	1699.4		AUVIL	64	RVUE
U26M	1673.0	6.0	DEVLIN	65	CNTR

26 N*1/2(1688) WIDTH (MEV)

U26W	120.0		FALK-VAIRAN	61	RVUE
U26W	170.0	20.0 10.0	OMNES	61	RVUE
U26W •	49.0	LOWER HALF WIDTH	AUVIL	64	RVUE
U26W •	48.0	HIGHER HALF WIDTH	AUVIL	64	RVUE
U26W •	43.0	3.0 LOWER HALF	DEVLIN	65	CNTR
U26W •	73.0	3.0 UPPER HALF	DEVLIN	65	CNTR

26 N*1/2(1688) DECAY MODES

U26P1	N*1/2(1688) INTO N PI	S16S 8
U26P2	N*1/2(1688) INTO N PI PI	S16S 8S 8
U26P3	N*1/2(1688) INTO LAMBDA K	S18S11
U26P4	N*1/2(1688) INTO ETA PROTON	S14S16
U26P5	N*1/2(1688) INTO N*1/2(1238)+PI	U31S08

26 N*1/2(1688) BRANCHING RATIOS

U26R1•	N*1/2(1688) INTO (N PI)/TOTAL					(P1)/TOTAL
U26R1	0.91	0.10	0.13	OMNES	61	RVUE
U26R1	0.88			LAYSON	63	RVUE
U26R1	0.82			AUVIL	64	RVUE
U26R1	0.90			DEVLIN	65	CNTR
U26R2•	N*1/2(1688) INTO(N ETA)/TOTAL					(P4)/TOTAL
U26R2•	0.02 OR LESS			KRAEMER +	64	HBC
U26R3•	N*1/2(1688) INTO (N*1/2(1238)+PI)/TOTAL					(P5)/TOTAL
U26R3•	SEEN ,NO RATIO QUOTED			CROUCH	65	HBC

$N^*(2190)$

27 N*1/2 (2190,JP=7/2-) I=1/2

SPIN,PARITY ASSIGNMENT NOT FINAL

27 N*1/2(2190) MASS (MEV)

U27M	2190.0	DIDDENS	63	CNTR
U27M	2210.	HOHLER	64	RVUE

27 N*1/2(2190) WIDTH (MEV)

U27W	200.0	DIDDENS	63	CNTR

27 N*1/2(2190) PARTIAL DECAY MODES

U27P1	N*1/2(2190) INTO N PI	S16S 8
U27P2	N*1/2(2190) INTO LAMBDA K	S18S11

U27P1• PI P FRACTION BASED ON GUESS THAT J=7/2
U27P2• SOME LAMBDA K MODE REPORTED BY SCHWARTZ 64

$N^*(2650)$

28 N*1/2 (2650,JP=9/2+) I=1/2

SPIN,PARITY ASSIGNMENT NOT FINAL

28 N*1/2(2650) MASS (MEV)

U28M	2700.0			R ALVAREZ	64	CNTR
U28M	2660.			HOHLER	64	RVUE
U28M	2645.0	10.0		CITRON	64	CNTR
U28M •	2600.0	APPROX		WAHLIG	64	SPRK 0

28 N*1/2(2650) WIDTH (MEV)

U28W	100.0	R ALVAREZ	64	CNTR
U28W	230.0	CITRON	64	CNTR

28 N*1/2(2650) PARTIAL DECAY MODES

U28P1	N*1/2(2700) INTO N ETA	S16S14
U28P2	N*1/2(2700) INTO N PI	S16S 8

28 N*1/2(2650) BRANCHING RATIOS

U28R1•	N*1/2(2700) INTO (N PI)/TOTAL				(P2)/TOTAL
U28R1•	0.06 OR LESS		R ALVAREZ	64	CNTR

REFERENCES ON BARYON RESONANCES

IDENTIFIC.	YR	AUTHORS	JOUR.	VOL	PAGE	YR	INSTITUTION	COD

N(1480)

24 N*1/2 (1480,JP=1/2+) I=1/2

BAREYRE	64	RVUE P BAREYRE +	PL	8	187	64	SACLAY+CAEN	U24
COCCONI	64	CNTR G COCCONI +	PL	8	134	64	CERN	U24
ROPER	64	RVUE L D ROPER	PRL	12	340	64	LRL-LIVERMORE	U24
ROPER	64	RVUE L.D.ROPER + R.M.WRIGHT	UCRL		7846	64	LRL-LIVERMORE	U24
ADELMAN	64	HBC S.L.ADELMAN	PRL	13	595	64	CAMBRIDGE	U24
AUVIL	64	RVUE P.AUVIL +	PL	12	76	64	IC+UC LONDON	U24
ADELMAN	65	RVUE ADELMAN S L	PRL	14	1043	65	CAVENDISH	U24
		FOR ARGUMENTS AGAINST RESONANT BEHAVIOUR SEE						U24
BRANDSDEN	64	RVUE B.H.BRANDSDEN +	PL	11	339	64	DURHAM+RUTHERFRD	U24
DALITZ	64	RVUE R.H.DALITZ+R.G.MOORHOUSE	PL	14	159	65	OXFORD RUTHERFRD	U24

N (1512)

25 N*1/2 (1512,JP=3/2-) I=1/2

PEIERLS	60	RVUE R F PEIERLS	PR	118	325	60	RVUE	U25
DETOEUF	61	RVUE J F DETOEUF	AIX	2	57	61	RVUE	U25
FALK-VARIANT	61	RVUE FALK-VARIANT,VALLADAS	RMP	33	362	61	RVUE	U25
MOYER	61	RVUE B J MOYER	RMP	33	367	61	RVUE	U25
OMNES	61	RVUE R OMNES,G VALLADAS	AIX	1	467	61	RVUE	U25
DEVLIN	62	CNTR DEVLIN,MOYER,PEREZMENDEZ	PR	125	690	62	CNTR	U25
BELLETTINI	63	CNTR G BELLETTINI +	NC	29	1165	63	PISA+FIR+WCL	U25
KIRZ	63	HBC KIRZ,SCHWARTZ,TRIPP	PR	130	2481	63	L R L	U25
LAYSON	63	RVUE W M LAYSON	NC	27	724	63	RVUE	U25
AUVIL	64	RVUE P AUVIL,C LOVELACE	NC	33	473	64	IMPER.COLLEGE	U25
BULOS	64	SPRK BULOS,LANOU,PIFER +	PRL	13	486	64	BRU+BRA+HA+MI+PAU	U25
DETOEUF	64	CNTR J F DETOEUF +	PL	8	76	64	SACLAY	U25
DEVLIN	65	CNTR DEVLIN, SOLOMON,BERTSCH	PRL	14	1031	65	PRINCETON	U25
CROUCH	65	HBC CROUCH,HARGRAVES +	DESY	CONF.		65	BRU+CEA+HA+MI+PAU	U25
		QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS						
CENCE	63	CNTR R CENCE,MOYER +	STANFORD			63	J P	U25
AUVIL	64	RVUE P AUVIL,C LOVELACE	NC	33	473	64	IMPER.COLLEGE	U25
ROPER	64	RVUE L.D.ROPER + R.M.WRIGHT	UCRL		7846	64	LRL-LIVERMORE	U25
ROPER	64	RVUE L D ROPER	PRL	12	340	64	J P	U25

N (1688)

26 N*1/2 (1688,JP=5/2+) I=1/2

PEIERLS	60	RVUE R F PEIERLS	PR	118	325	60	RVUE	U26
FALK-VARIAN	61	RVUE FALK-VARIANT,VALLADAS	RMP	33	362	61	RVUE	U26
MOYER	61	RVUE B J MOYER	RMP	33	367	61	RVUE	U26
OMNES	61	RVUE R OMNES,G VALLADAS	AIX	1	467	61	RVUE	U26
LAYSON	63	RVUE W M LAYSON	NC	27	724	63	RVUE	U26
KRAEMER	64	HBC R KRAEMER +	PR	136	B496	64	HOPKINS+NW+WDSTK	U26
CROUCH	65	HBC CROUCH,HARGRAVES +	DESY	CONF.		65	BRU+CEA+HA+MI+PAU	U26
DEVLIN	65	CNTR DEVLIN, SOLOMON,BERTSCH	PRL	14	1031	65	PRINCETON	U26
		QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS						U26
DETOEUF	61	RVUE J F DETOEUF	AIX	2	57	61	J	U26
CENCE	63	CNTR R CENCE,MOYER +	STANFORD			63	J P	U26
HELLAND	63	SPRK J A HELLAND +	PRL	10	27	63	J	U26
AUVIL	64	RVUE P AUVIL,C LOVELACE	NC	33	473	64	IMPER.COLLEGE	U26

N(2190)

27 N*1/2 (2190,JP=7/2-) I=1/2

SPIN,PARITY ASSIGNMENT NOT FINAL

DIDDENS	63	CNTR A N DIDDENS +	PRL	10	262	63	B N L	U27
SCHWARTZ	64	HBC J SCHWARTZ +	BAPS	9	420	64	L R L	U27
HOHLER	64	RVUE G.HOHLER + J.GIESECKE	PL	12	149	64	KARLSRUHE	U27
		QUANTUM NUMBER DETERMINATION NOT REFERRED TO IN DATA CARDS						U27
DONNACHIE	64	RVUE DONNACHIE+HAMILTON PREVIOUS ASSIGNMENT BASED ON DISPERSION RELATION CALCULAT.	ANP	31	410	65	UCL , J,P	U27 U27

N(2650)

28 N*1/2 (2650,JP=9/2+) I=1/2

SPIN,PARITY ASSIGNMENT NOT FINAL

R ALVAREZ	64	CNTR R ALVAREZ +	PRL	12	710	64	MIT+CEA	U28
CITRON	64	CNTR A CITRON +	PRL	13	205	64	BNL	U28
HOHLER	64	RVUE G.HOHLER + J.GIESECKE	PL	12	149	64	KARLSRUHE	U28
WAHLIG	64	SPRK M.A.WAHLIG	PRL	13	103	64	MIT	U28
		QUANTUM NUMBER DETERMINATION NOT REFERRED TO IN DATA CARDS						U28
DONNACHIE	64	RVUE DONNACHIE+HAMILTON PREVIOUS ASSIGNMENT BASED ON DISPERSION RELATION CALCULAT.	ANP	31	410	65	UCL , J,P	U28 U28

TABLES FROM UCRL-8030(rev.) March 1965

Table S – Stable particles

	$I(J^{PG})C$	Mass (MeV)	Mass difference (MeV)	Mean life (sec)	$Mass^2$ $(BeV)^2$	Magnetic moment $(e/2m_p)$	Important decays: Partial mode	Fraction	Q (MeV)	p or p_{max} (MeV/c)
LEPTONS										
γ	$J^P=1^-C^-$			stable	0		stable			
ν_e	J=1/2	0(<0.2 keV)		stable	0		stable			
ν_μ		0(<2.5 MeV)			0					
$e^\pm$	J=1/2	0.511006 ±0.000002		stable	0.000	1.0011609 † ±.0000024	stable			
$\mu^\pm$	J=1/2	105.659 ±0.002	-33.95 ±0.05	2.2001×10^{-6} ±.0008 Xscale=2.5	0.011	[1.001162 ±.000005 in e/m_μ]	$e\nu\bar{\nu}$	100%	105.15	52.8
MESONS										
$\pi^\pm$	$1(0^{--})C^+_n$	139.580 ±0.015	4.6056 ±0.0055	2.551×10^{-8} ±.026	0.019		$\mu\nu$	100%	33.92	29.80
							$e\nu$	$(1.24\pm.03)10^{-4}$	139.07	69.80
							$\mu\nu\gamma$	$(1.24\pm.25)10^{-4}$	33.92	29.80
							$\pi^0 e\nu$	$(1.11\pm.08)10^{-8}$	4.09	4.50
π^0		134.974 ±0.015		1.78×10^{-16} ±.26 Xscale=1.3	0.018		$\gamma\gamma$	98.8	135.00	67.50
							γe^+e^-	(1.19±.05)%	133.95	67.49
$K^\pm$	1/2(0⁻)	493.78 ±0.47	-3.90 ±0.25	1.229×10^{-8} ±.008	0.244		$\mu\nu$	(63.2±.4)%	388.1	235.6
							$\pi^0\mu\nu$	(21.3±.4)%	219.2	205.2
							$\pi^0\pi^-\pi^+$	(5.5±.1)%	75.0	125.5
							For other decays see Table S-Decay			
K^0		497.7 ±0.30		50%K1, 50%K2						
K_1			-0.91x10^{10}/τ_1 ±0.07	0.881×10^{-10} ±.010 Xscale=1.4	0.248		$\pi^+\pi^-$	(68.5±1.0)%	218.5	206.0
							$\pi^0\pi^0$	(31.5±1.0)%	227.8	209.1
K_2			Xscale=2.3	5.77×10^{-8} ±.59	0.248		$\pi^0\pi^0\pi^0$	(24.8±3.0)%	92.8	139.3
							$\pi^+\pi^-\pi^0$	(13.6±1.0)%	83.6	132.8
							$\pi\mu\nu$	(26.2±2.6)%	252.5	216.0
							$\pi e\nu$	(35.4±2.7)%	357.6	229.3
							$\pi^+\pi^-$	(2.1±0.3)$\times10^{-3}$	218.5	206.0
η	$0(0^{-+})C^+$	548.8 ±0.5		Γ < 10 MeV	0.301		$\gamma\gamma$	(38.6±2.7)%	548.7	274.3
							$3\pi^0$ or $\pi^0 2\gamma$	(30.8±2.3)%	143.8	179.5
							$\pi^+\pi^-\pi^0$	(25.0±1.6)%	134.8	174.4
							$\pi^+\pi^-\gamma$	(5.5±1.2)%	269.5	236.2
							$e^+e^-\pi^+\pi^-$	<(1.1±1.1)%	412.7	257.7
BARYONS										
p	1/2(1/2⁺)	938.256 ±0.005	-1.2933 ±0.0001	stable	0.880	2.792816 ±.000034				
n		939.550 ±0.005		1.01×10^3 ±.03	0.882	-1.913148 ±.000066	$pe^-\nu$	100%	0.78	1.19
Λ	0(1/2⁺)	1115.44 ±0.12 Xscale=1.2		2.61×10^{-10} ±.02 Xscale=1.5	1.242	-0.73 ±0.17	$p\pi^-$	(66.3±1.0)%	37.6	100.2
							$n\pi^0$	(33.6±1.0)%	40.9	103.7
							Xscale=1.3			
							For other decays see Table S-Decay			
Σ^+	1(1/2⁺)	1189.39 ±0.14	7.90 ±0.09	0.794×10^{-10} ±.026	1.415	4.3±1.5	$p\pi^0$	51.0±2.4%	116.2	189.0
							$n\pi^+$	49.0±2.4%	110.3	185.0
							For other decays see Table S-Decay			
Σ^0		1192.3 ±0.2	4.86 ±0.07	$<1.0\times10^{-14}$	1.422		$\Lambda\gamma$	100%	77.0	74.5
							See Table S-Decay			
Σ^-		1197.20 ±0.14		1.58×10^{-10} ±.05	1.433		$n\pi^-$	100%	118.1	192.8
							For other decays see Table S-Decay			
Ξ^0	1/2(1/2⁺) ?	1314.3 ±1.0	6.5 ±1.0	3.05×10^{-10} ±.38 X scale = 1.3	1.727		$\Lambda\pi^0$	100%	63.9	134.8
							For other decays see Table S-Decay			
Ξ^-		1320.8 ±0.2		1.75×10^{-10} ±.05 X scale = 1.1	1.745		$\Lambda\pi^-$	100%	65.8	138.7
							$\Lambda e^-\nu$	$\leq1.7\times10^{-3}$	204.9	189.4
							$n\pi^-$	$<5\times10^{-3}$	241.7	303.0
Ω^-	0(3/2⁺) ? ?	1675 ±3		1.3×10^{-10} ±.7	2.806		$\Xi\pi$	?	221	296
							$\Lambda\bar{K}$	?	66	216

†In units of $(e/2m_p)$.

A. H. Rosenfeld, A. Barbaro-Galtieri, W. H. Barkas, P. L. Bastien, J. Kirz, and M. Roos, UCRL-8030 - Part I, August, 1965.

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Table S-Decay

An Appendix to Table S for decay parameters and branching fractions

	Partial mode	Fraction	Q (MeV)	p or p_{max} (MeV/c)	$\alpha^\dagger$	$\beta^\dagger$	$\gamma^\dagger$	$\Delta^\dagger$
$K^\pm$	$\mu^+\nu$	(63.2 ±.4)%	388.1	235.6				
	$\pi^0e^+\nu$	(21.3 ±.4)%	219.2	205.2				
	$\pi^+\pi^-e^+\nu$	(5.52±.06)%	75.0	125.5				
	$\pi^+\pi^-\pi^0$	(1.68±.05)%	84.3	133.0				
	$\pi^0\mu^+\nu$	(3.4 ±.2)%	253.1	215.2				
	$\pi^+e^+e^-$	(4.9 ±.2)%	358.3	228.4				
	$\pi^0\pi^0e^+\nu$	(4.3 ±.3)$\times10^{-5}$	214.1	203.5				
	$\pi^0\pi^0\mu^+\nu$	<0.1 $\times10^{-5}$	214.1	203.5				
	$\pi^+\pi^-\gamma$	(2.2 ±0.7)$\times10^{-4}$	219.2	205.2				
	$\pi^+\mu^+\mu^-$	<1.2 $\times10^{-5}$	109.0	151.1				
	$\pi^+e^+e^-$	<1.1 $\times10^{-6}$	353.2	227.2				
	$\mu^+\mu^-$	<3 $\times10^{-6}$	142.9	176.9				
	$e^+\nu$	<1.6 $\times10^{-3}$	493.3	246.9				
	$\pi^+\pi^-\gamma$	(9 ±4)$\times10^{-5}$	75.0	125.5				
Λ	$p\pi^-$	(66.3 ±1.0)% Xscale 37.6		100.2	+0.659±0.047			(15±20)°
	$n\pi^0$	(33.6 ±1.0)% (±1.2	40.9	103.7				
	$p\mu\nu$	(1.5 ±1.2)10^{-4}	71.5	130.8				
	$pe\nu$	(0.88±.08)10^{-3} Xscale = 1.3	176.7	163.1				
Σ^+	$p\pi^0$	(51.0 ±2.4)%	116.2	189.0	-0.79±.09			
	$n\pi^+$	(49.0 ±2.4)%	110.3	185.1	-0.05±0.08			
	$n\pi^+\gamma$	=0.2 $\times10^{-2}$	110.3	185.1				
	$\Lambda e^+\nu$	=0.2 $\times10^{-4}$	73.4	71.6				
	$p\gamma$	(3.7 ±0.8)$\times10^{-4}$	251.1	224.6				
	$n\mu^+\nu$	<1.1 $\times10^{-4}$	144.2	202.4				
	$ne^+\nu$	<0.5 $\times10^{-4}$	249.3	223.6				
Σ^0	$\Lambda\gamma$	100%	77.0	74.5				
Σ^-	$n\pi^-$	100%	118.1	192.8	-0.16±.21			
	$n\pi^-\gamma$	=0.1 $\times10^{-4}$	118.1	192.8				
	$n\mu^-\nu$	(0.66±.15)10^{-3}	152.0	209.4				
	$ne^-\nu$	(1.2 ±0.2)10^{-3}	257.1	229.9				
	$\Lambda e^-\nu$	(0.75±.28)10^{-4}	81.2	79.0				
Ξ^0	$\Lambda\pi^0$	=100%	63.9	134.8	-0.34±.12	0.05	0.94	(8±62)°
	$p\pi^-$	<2.7%	236.5	298.7				
	$p\mu^-\nu$	<2.7%	375.5	322.2				
	$\Sigma^0e^-\nu$	<1.3%	124.4	119.0				
	$\Sigma^0e^+\nu$		116.6	111.9				
Ξ^-	$\Lambda\pi^-$	100%	65.8	138.7	-0.410±.046	+0.12	0.90	(-17±18)°
	$\Lambda e^-\nu$	<1.7 $\times10^{-3}$	204.9	189.4				
	$n\pi^-$	<5 $\times10^{-3}$	241.7	303.0				

†The definition of these quantities is taken as follows:

$$\alpha = \frac{2\,\mathrm{Re}(S^*P)}{|S|^2+|P|^2}; \quad \beta = \frac{2\,\mathrm{Im}(S^*P)}{|S|^2+|P|^2}; \quad \gamma = \frac{|S|^2-|P|^2}{|S|^2+|P|^2}; \quad \tan\Delta = \frac{\beta}{\alpha}.$$

Mesons

	Mass (MeV)	$I(J^{PG})CA$	Symbol	Γ (MeV)	$\Gamma(M^2)^2_{1/2}$ $(BeV)^2$	$(Mass)^2$ $(BeV)^2$	Important decays: Partial modes	Fraction (%)	Q (MeV)	p_π or p_{max} (MeV/c)
η	548.9 ±0.5	$0(0^{-+})C^+A^-$	η_β	<10	0.301 ≤ 0.01		See Table S			
ω	782.8 ±0.5 Xscale=1.9	$0(1^{--})C^-A^-$	η_γ	12.0 ±1.7 Xscale=1.2	0.613 0.019		$\pi^+\pi^-\pi^0$	88	369	327
								seen †	504	366
							neutral($\pi^0\gamma$)	12±2	648	380
							η+neutral	<1.7	234	199
							$\pi^0e^+e^-$	<3.2	504	366
							e^+e^-	≈0.01	782	391
							$\mu^+\mu^-$	<0.10	572	377
X^0 or η'	958.6 ±1.6	$0(0^{-+})C^+A^-$	η_β	<4	0.920 <0.008		$\eta2\pi^-\pi^+$	76±4	111	232
							$\pi^+\pi^-\gamma$	24±4	680	459
							Xscale=1.2			
K_1K_1	≈1000	May be just large KK scattering length, see listings of data cards.								
ϕ	1019.5 ±0.3 Xscale=1.7	$0(1^{--})C^-A^+$	η_γ	3.3 ±0.6	1.039 0.007		K_1K_2	38±3	23	109
							K^+K^-	30±3	32	126
							$\pi\rho+3\pi$	32±8	117	188
							Xscale=1.4			
							$\pi^0\gamma$		885	501
							η+neutral	<12	471	362
							$\mu^+\mu^-$	<0.5	808	499
							e^+e^-	<0.4	1018	510
f	1253 ±20	$0(2^{++})C^+A^+$	η^{II}_α	118 ±16	1.574 0.294		$\pi\pi$	large	974	611
							4π	<4	695	547
							$K\bar{K}$	<4	265	386
D	1286 ±6	$0(1^{++})C^+A^-$	η	40 ±10	1.65 0.105		$K\bar{K}\pi$		154	303
E (a)	1420 ±10	0( )CA^- ??	η	60 ±10	2.02 0.17		$K^*\bar{K}$ $K\bar{K}\pi$	large	35 293	451 430
f'	1500	$0(2^{++})C^+A$	η^{II}_α	80	2.25 0.24		K_1K_1 $K\bar{K}\pi$(890)		505 111	561 274
π	$\pi^\pm$ 139.6 π^0 135.0	$1(0^{-+})C^+_nA^-$	π_β		0.019 0.018		See Table S			
ρ	765 ±3 Xscale=1.3	$1(1^{--})C^-_nA^+$	π_γ	124 ±4 Xscale=2.8	0.585 0.173		2π	100	486	357
							4π	<5	207	243
							$\pi\gamma$	<2	626	370
							e^+e^-	≈0.0065	764	382
A1 (b)	1072 ±8 Xscale=1.6	$1(1^{+-})C^-_nA^+$	π	125	1.150 0.27		$\rho\pi$ $\bar{K}K$	≈100 <5	167 C for bidden for odd J	231
B (b)	1220	$1(2^{++})C^+_nA^+$	π	125 ±17 Xscale=2.2	1.488 0.31		$\omega\pi$ $\pi\pi$ $K\bar{K}$ 4π	≈100 <30 <10 <50	298 Permitted only for 1^- assignment, if J<3 662	339 528
A2	1324 ±9 Xscale=2.5	$1(2^{++})C^+_n$	$-\pi^{II}_\alpha$	90 ±10	1.753 0.24		$\rho\pi$ $\bar{K}K$ $\eta\pi$	≈91 5.5±4.5 3.6±3.0	419 333 636 Xscale=1.3	426 439 537
$K^\pm$	493.8	$1/2(0^-)A^+$	K_β		0.244 0.248		See Table S			
K^0	497.8									
κ (b)	725 ±2	$1/2(0^+)A^+$	K	<12	0.526 <0.017		$K\pi$	≈100	92	154
K^*	891.4 ±0.8	$1/2(1^-)A^+$	K_γ	49 ±2 Xscale=1.1	0.794 0.087		$K\pi$ $K\pi\gamma$ $\kappa\pi$	≈100 <0.2 <0.2	258 118 27	288 245 82
C (a)	1215 ±15	≤3/2( )A^+ ⟼ ??	K	60 ±10	1.476 0.145		$K\rho$ $K\pi$	? ?	~44 184	<0 253
K^*	1405 ±8	$1/2(2^+)A^+$	K	95 ±11	1.988 0.27		$K\pi$	?	775	610

†Reported values range between <0.5 and 1%, and depend on assumptions on $p-\mu$ interference.
(a) It has not been shown that this entry corresponds to a state with well defined quantum numbers.
(b) It has not been shown that this entry corresponds to a state with well defined quantum numbers. See text for references suggesting alternate mechanism.

A. H. Rosenfeld, A. Barbaro-Galtieri, W. H. Barkas, P. L. Bastien, J. Kirz, and M. Roos, UCRL-8030 - Part I, August 1965.

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Table IIIa. Multiple Coulomb scattering and Lorentz transformation

The rms projected angle θ due to multiple Coulomb scattering (only) of a particle of charge z, momentum P, velocity V is

$$\theta_{proj} = z\,\frac{15(\mathrm{MeV})}{PV(\mathrm{MeV})}\sqrt{\frac{L}{L_{(\mathrm{rad})}}}\,(1+\epsilon)\ \text{radians};$$

L = Length in scatterer; L(radiation) from Table II. For $L \geq 1/10$ L(rad) ϵ is generally < 1/10. The distribution of θ is not truly Gaussian. The rms projected displacement y on traversing an absorber of thickness L is

$$y_{rms} = L\theta_{proj}/\sqrt{3}$$

Lorentz transformations. Notation: Lower-case type for c. m. 4-momentum (p, w) and capitals for lab ($\vec{P}$, W). (c≡1.) To transform from c. m. to lab write

$$\begin{pmatrix} \gamma & 0 & 0 & \eta \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ \eta & 0 & 0 & \gamma \end{pmatrix} \begin{pmatrix} p\cos\theta \\ p\sin\theta \\ 0 \\ w \end{pmatrix} = \begin{pmatrix} \gamma p\cos\theta + \eta w \\ p\sin\theta \\ 0 \\ \eta p\cos\theta + \gamma w \end{pmatrix} = \begin{pmatrix} P\cos\Theta \\ P\sin\Theta \\ 0 \\ W \end{pmatrix}$$

If two particles (1 and 2) collide, the invariant "mass" μ of the system is given by

$$\mu^2 = (W_1 + W_2)^2 - (\vec{P}_1 + \vec{P}_2)^2. \qquad (1)$$

$$\gamma = \frac{W_1 + W_2}{\mu}; \quad \eta = \left|\frac{\vec{P}_1 + \vec{P}_2}{\mu}\right| = \gamma\beta. \qquad (2)$$

Write T for lab kinetic energy, t for c.m.: thus $\mu = m_1 + m_2 + t_1 + t_2 = m_1 + m_2 + Q$. If the target is at rest $(0, m_2)$ μ simplifies:

$$\mu^2 = (m_1 + m_2)^2 + 2T_1m_2. \qquad (3)$$

To get a threshold T_1, set μ = sum of masses of reaction products, then

$$[\Sigma m(\text{products})]^2 = (m_1 + m_2)^2 + 2T_1m_2. \qquad (4)$$

Other invariants are: $w_1w_2 - P_1P_2\cos\theta_{12}$ (5)

and

$$\frac{1}{p}\frac{d^2\sigma}{d\omega\,dw}. \qquad (6)$$

The max. lab angle that a particle of c. m. momentum p_1 can have is given by

$$\sin\Theta_1 = \frac{\eta_1}{\eta}\ (\eta_1 = \frac{p_1}{m_1}\ \text{must be} < \eta); \qquad (7)$$

If $\eta_1 > \eta$, then of course Θ_1 can be π.
Crawford's mnemonic for extending nonrelativistic formulas to relativistic case: "To the rest energy of each moving particle add Q/2" where Q = the total kinetic energy (c. m.) = $\mu - \Sigma m_i$.
Thus in the rest frame of a two-body decay the kinetic energy Q is shared between the two particles according to

$$t_1 = Q\,\frac{m_2 + Q/2}{\mu}, \quad t_2 = Q\,\frac{m_1 + Q/2}{\mu}. \qquad (8)$$

The above of course applies in the c. m. for the production of a two-body final state. To express t in terms of p_1 apply the mnemonic to a single particle (then Q = t). The non-rel. relation $p^2 = 2tm$ becomes

$$p^2 = 2t(m + t/2) = 2tm + t^2. \qquad (9)$$

Energy Transfer for elastic collisions of beam $(\vec{P}_1, W_1)$ with resting target $(0, m_2)$, is

$$T_2 = 2m_2\,\frac{P_1^2}{\mu^2}\sin^2(\theta_{c.m.}/2). \qquad (10)$$

Note that for max T_2, $\theta_{c.m.} = \pi$, so

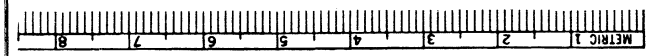
$$T_{2max.} = 2m_2\,P_1^2/\mu^2 \approx 2\,m_2\eta^2. \qquad (11)$$

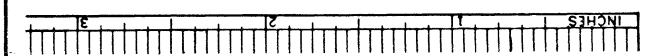
MUB-1849

Table II. Atomic and nuclear properties (dE/dx, collision mean free path, radiation length, etc.) of materials used as absorbers and detectors

Material	Z	A	Cross section σ [a] (barns)	$\frac{dE}{dx}$ [b] min Mev / g/cm^2	Collision [a] length g/cm^2	Collision [a] length L_{coll} cm	Radiation [c] length g/cm^2	Radiation [c] length L_{rad} cm	Density ρ (g/cm^3)
H_2	1	1.01	0.063	4.14	26.5	374	58	819.0	0.0708 (boiling at 1 atmos)
Li	3	6.94	0.23	1.72	50.4	94.3	77.5	145	0.534
Be	4	9.01	0.28	1.71	55.0	29.9	62.2	33.8	1.84
C	6	12.00	0.33	1.86	60.4	39.0	42.5	27.4	1.55 (variable)
Al	13	26.97	0.57	1.66	79.2	29.3	23.9	8.86	2.70
Cu	29	63.57	1.00	1.45	105.4	11.8	12.8	1.44	8.9
Sn	50	118.70	1.55	1.27	129.7	17.8	8.54	1.17	7.30
Pb	82	207.21	2.20	1.12	156.2	13.8	5.8	0.51	11.34
U	92	238.07	2.42	1.095	163.6	8.75	5.5	0.29	18.7
Hydrogen (bubble chamber, ~27.6°K)				0.243 Mev/cm	26.5	452	58	990	0.0586
Propane (C_3H_8, bubble chamber)				0.935 Mev/cm	48.9	119.3	44.7	109.0	0.41
Freon CF_3Br				2.3	87.1	58.0	17.25	11.5	1.5
Polystyrene (CH scintillator)				2.14 Mev/cm	54.9	52.3	43.4	41.3	~1.05
Ilford emulsion				5.49 Mev/cm	103	27.0	11.2	2.91	3.815

MUB-1831





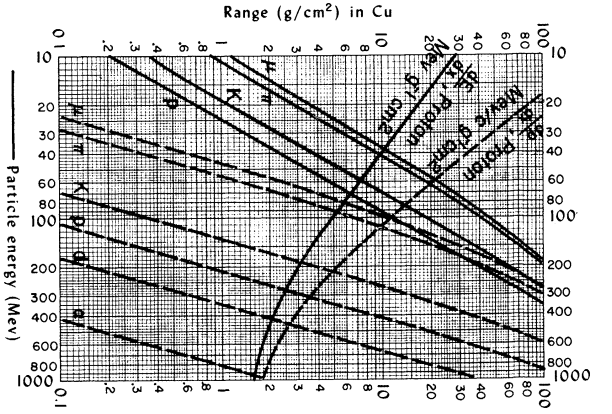


Table of χ^2 for N degrees of freedom and confidence level CL

	Degrees of freedom, N										
CL	1	2	3	4	5	7	10	15	20	25	30
0.5	0.5	1.4	2.4	3.4	4.4	6.3	9.3	14.3	19.3	24.3	29.3
0.2	1.6	3.2	4.6	6.0	7.3	9.8	13.4	19.3	25.0	30.7	36.3
0.1	2.7	4.6	6.3	7.8	9.2	12.0	16.0	22.3	28.4	34.4	40.3
0.05	3.8	6.0	7.8	9.5	11.1	14.1	18.3	25.0	31.4	37.7	43.8
0.02	5.4	7.8	9.8	11.7	13.4	16.6	21.2	28.3	35.0	41.6	48.0
0.01	6.6	9.2	11.3	13.3	15.1	18.5	23.2	30.6	37.6	44.3	50.9
0.005	7.9	10.6	12.8	14.9	16.7	20.3	25.2	32.8	40.0	47.0	53.7
0.001	10.8	13.8	16.3	18.5	20.5	24.3	29.6	37.7	45.3	52.6	59.7
0.0001	15.1	18.4	21.1	23.5	25.7	29.9	35.6	44.3	52.4	60.1	67.6

For $N > 30$ $\quad CL \approx (1/\sqrt{2\pi}) \int_y^\infty \exp(-y^2/2)dy$; $\quad y = \sqrt{2\chi^2} - \sqrt{2n-1}$

MUB-6202

TABLES FROM UCRL-8030(rev.)

Table IV. Atomic and nuclear constants in units of MeV, cm, and sec [a]

GENERAL ATOMIC CONSTANTS

$N = 6.02252 \times 10^{23}$ molecules/mole [b]

$c = 2.997925 \times 10^{10}$ cm/sec

$e = 4.80298 \times 10^{-10}$ esu $= 1.6021 \times 10^{-19}$ coulomb.

1 MeV $= 1.6021 \times 10^{-6}$ erg [1 ev $= e(10^8/c)$]

$\hbar = 6.5820 \times 10^{-22}$ MeV sec $= 1.05450 \times 10^{-27}$ erg sec.

$\hbar c = 1.9732 \times 10^{-11}$ MeV cm [$= \lambda$ for $p = 1$ MeV/c]

$k = 8.6171 \times 10^{-11}$ MeV/°C[Boltzmann constant]

$\alpha = \frac{e^2}{\hbar c} = 1/137.0388$; $e^2 = 1.4399 \times 10^{-13}$ MeV cm

Cross Section

$\sigma_{Thompson} = \frac{8}{3} \pi r_e^2 = 0.66516 \times 10^{-24}$ cm^2 $= 0.66516$ barn

Magnetic Moment and Cyclotron Angular Frequency

$\mu_{Bohr} = \frac{e\hbar}{2mc} = 0.578815 \times 10^{-14}$ MeV/gauss

$\frac{1}{2}\omega_{cyclotron} = \frac{e}{2mc} = 8.79398 \times 10^6$ rad sec^{-1}/gauss

$g_{electron} = 2[1 + \frac{\alpha}{2\pi} - 0.328 (\frac{\alpha}{\pi})^2] = 2[1.001159615]$ [c]

$g_{muon} = 2[1 + \frac{\alpha}{2\pi} + 0.75 (\frac{\alpha}{\pi})^2] = 2[1.001165010]$ [c]

QUANTITIES DERIVED FROM THE ELECTRON MASS, m

Mass and Energy

$m = 0.511006$ MeV $= 1/1836.10\ m_p = 1/273.19\ m_\pi$

Rydberg, $R_\infty = \frac{me^4}{2\hbar^2} = mc^2 \times \frac{\alpha^2}{2} = 13.605$ eV

Length (1 fermi $= 10^{-13}$ cm; 1 A $= 10^{-8}$ cm)

$r_e = e^2/mc^2 = 2.8177$ fermi

$\lambda_{Compton} = \frac{\hbar}{mc} = r_e \alpha^{-1} = 3.86144 \times 10^{-11}$ cm

a_∞ Bohr $= \frac{\hbar^2}{me^2} = r_e \alpha^{-2} = 0.52967$ A

Hydrogen-like atom (Non. Rel.; $\mu \equiv$ reduced mass).

$E_n = \frac{1}{2}\frac{\mu z^2 e^4}{(n\hbar)^2}$; $a_{n=1} = \frac{\hbar^2}{\mu z e^2}$; $\frac{v}{c})_{rms} = \frac{ze^2}{n\hbar c}$

QUANTITIES DERIVED FROM THE PROTON MASS, m_p

Rest mass $= 938.256$ MeV/$c^2 = 1836.10\ m_e = 6.722\ m_\pi$

$= 1.0072766\ m_1$

where $m_1 = 1$ amu $= \frac{1}{12} C^{12} = 931.478$ MeV

Magnetic Moment and Cyclotron Angular Frequency

$\mu_p = \frac{e\hbar}{2m_p c} = 3.1524 \times 10^{-18}$ MeV/gauss

$\frac{1}{2}\omega_{cyclotron} = \frac{e}{2m_p c} = 4.7894 \times 10^3$ rad sec^{-1}/gauss

$\frac{\mu}{\mu_p})_{proton} = 2.79276$; $\quad \frac{\mu}{\mu_p})_{neutron} = -1.9128$

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Table IV (continued)

QUANTITIES DERIVED FROM THE MASS OF THE CHARGED PION, m_π

Rest mass $= 139.60$ MeV/$c^2 = 273.19\ m_e = 0.14878\ m_p$

Length

$\frac{\hbar}{m_\pi c} = 1.4135$ fermi ($\sim \sqrt{2}$ fermi)

Natural (≡ "geometrical") Nucleon Cross Section

$\pi \left(\frac{\hbar}{m_\pi c}\right)^2 = 62.7655$ mb (1 mb $= 10^{-27}$ cm^2)

(3/2, 3/2)πp Resonance of mass 1237 MeV (Q = 159 MeV).

Center-of-mass momentum: $p_\pi = 230$ MeV/c

Lab-system momentum: $P_\pi = 303$ MeV/c ($T_\pi = 195$ MeV)

RADIOACTIVITY

1 curie $= 3.7 \times 10^{10}$ disintegrations/sec

1 R $= 87.8$ ergs/g air $= 5.49 \times 10^7$ MeV/g air

Fluxes (per cm^2) to liberate 1 R in carbon:

3×10^7 minimum ionizing singly charged particles

0.9×10^9 photons of 1 MeV energy.

(These fluxes are actually correct to within a factor of two for all materials.)

Natural background: 100 mR/year

"Tolerance" 100 millirem/week [Note, 1 R may produce up to 10 "Rem" (R equivalent for man), depending on type of radiation.]

MISCELLANEOUS

Physical Constants

1 year $= 3.1536 \times 10^7$ sec ($\approx \pi \times 10^7$ sec)

Density of air $= 1.205$ mg/cm^3 at 20°C

Acceleration by gravity $= 980.67$ cm/sec^2

1 calorie $= 4.184$ joules

1 atmosphere $= 1033.2$ g/cm^2

Numerical Constants

1 radian $= 57.29578$ deg; $e = 2.71828$

ln 2 $= 0.69315$; $\log_{10} e = 0.43429$;

ln 10 $= 2.30259$; $\log_{10} 2 = 0.30103$.

Stirling's approximation

$\sqrt{2\pi n}\,(\frac{n}{e})^n < n! < \sqrt{2\pi n}\,(\frac{n}{e})^n (1 + \frac{1}{12n-1})$

Gaussianlike Distributions

For $n > -1$ but not necessarily integral:

$\int_0^\infty x^{2n+1} \exp\left[-\frac{x^2}{2\sigma^2}\right] dx = 2^n n!\ \sigma^{2n+2}$; $(\frac{1}{2})! = \sqrt{\pi}/2$

Relation between standard deviation σ and mean deviation a:

$2\sigma^2 = \pi a^2$, $\sigma = 1.4826$ probable error.

Odds against exceeding one standard deviation = 2.15:1; two, 21:1; three, 370:1; four, 16,000:1; five, 1,700,000:1

[a] Based mainly on E. Richard Cohen and J. W. M. DuMond, "Present Status of our Knowledge of the Numerical Values of the Fundamental Physical Constants," Second International Conference on Nuclidic Masses, Vienna, Austria, July 15-19, 1963.

[b] Based on atomic weight of C^{12} being exactly 12.

[c] C. Sommerfield, Phys. Rev. 107, 328 (1957) and A. Petermans, Helv. Phys. Acta. 30, 407 (1957).

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Baryons

		Beam π and K (MeV) and (MeV/c)	I(J^P) ⟼=estab.	Symbol	Mass (MeV)	Γ (MeV)	Mass^2 and Γ(M^2) (BeV)^2	Important decays: Partial mode	Fraction (%)	Q (MeV)	p or Pmax (MeV/c)
N	p See Table S		1/2(1/2+)	N_α	938.2 939.6		0.88 0.88	See Table S			
	$N^0_{1/2}(1480)$	550 MeV 675 MeV/c	1/2(1/2+)		Existence not yet definitely established						
	$N^0_{1/2}(1518)$	610 MeV 737 MeV/c	1/2(3/2−)	N_γ	1518 ±10	120	2.30 0.37	πN Nππ	75	440 301	454 408
	$N^0_{1/2}(1688)$	900 MeV 1030 MeV/c	1/2(5/2+)	N^{II}_α	1688	100	2.85 0.34	πN Nππ ηN ΛK	≈85 < 2	610 471 201 75	572 538 389 231
	$N^0_{1/2}(2190)$	1935 MeV 2070 MeV/c	1/2(7/2−) ⟼ ??	N^{II}_γ(?)	2190	≈200	4.80 0.88	πN ΛK	≈40 seen	1112 577	888 710
	$N^0_{1/2}(2650)$	3113 MeV 3250 MeV/c	1/2(9/2+) ⟼ ??	N^{III}_α	2645 ±10	≈200	7.00 1.06	πN ηN		1567 1158	1151 1090
Δ	$N^0_{3/2}(1236)$	196 MeV 305 MeV/c	3/2(3/2+)	Δ_δ	1236.0 ±0.4	120.0 ±1.5	1.53 0.30	πN	100	160	233
	$N^0_{3/2}(1924)$	1354 MeV 1488 MeV/c	3/2(7/2+)	Δ^{II}_δ	1924	170	3.70 0.65	πN ΣK	< 67	846 241	725 435
	$N^0_{3/2}(2360)$	2349 MeV 2485 MeV/c	3/2(9/2−) ⟼ ??	Δ^{III}_β(?)	2360	~200	5.58 0.95	πN	≈15	1282	988
	$N^0_{3/2}(2825)$	3633 MeV 3770 MeV/c	3/2(11/2+) ⟼ ??	Δ^{III}_δ	2825	260	7.98 1.47	πN		1747	1252
Λ	Λ See Table S		0(1/2+)	Λ_α	1115.4		1.24	See Table S			
	$Y^0_0(1405)$	< 0 Kp	0(1/2−)	Λ_β	1405	35±5	1.97 0.10	Σπ Λππ	100 < 1	76 10	151 69
	$Y^0_0(1520)$	137 MeV 393 MeV/c	0(3/2−)	Λ_γ	1518.9 ±1.5	16 ±2	2.31 0.05	Σπ $\bar{K}$N Λππ	55±7 29±4 16±2	190 87 124	266 243 251
	$Y^0_0(1815)$	662 MeV 1045 MeV/c	0(5/2+)	Λ^{II}_α	1815 ±5	50	3.29 0.18	$\bar{K}$N Σπ Λππ Λη	≈ 75 ≈ 9 ≈ 15 ≈ 1	378 486 420 151	538 504 515 344
							[mainly $Y^0_1(1385)+\pi$]	←			
Σ	Σ See Table S		1(1/2+)	Σ_α	(+) 1189.5 (0) 1192.6 (−) 1197.4		1.41 1.42 1.43	See Table S			
	$Y^0_1(1385)$	< 0 Kp	1(3/2+)	Σ_δ	1382.7 ±.5 Xscale=1.5	44 ±2 Xscale=2.8	1.91 0.12	Λπ Σπ	90±2 10±2 Xscale=1.4	127 55	205 124
	$Y^0_1(1660)$	374 MeV 715 MeV/c	1(>3/2) ⟼	$\Sigma\beta$	1660 ±10	44 ±5	2.76 0.15	$\bar{K}$N Σπ Λπ Σππ Λππ	≈ 15 ≈ 30 ≈ 5 ≈ 30 ≈ 20	223 328 405 188 265	400 383 439 321 389
							[mainly $Y^0_0(1405)+\pi$]	←			
	$Y^0_1(1765)$	561 MeV 932 MeV/c	1(5/2−)	Σ_β	1762 ±17	75 ±7 Xscale=2.1	3.11 0.26	$\bar{K}$N Λπ Σπ $Y^0_1(1385)+\pi$ $Y^0_0(1520)+\pi$	≈ 60 ≈ 16 ≤ 3 ≈ 10 ≈ 10	328 510 436 243 107	496 517 467 318 188
	$Y^0_1(2065)$	1180 MeV 1600 MeV/c	1(7/2+)	Σ^{II}_δ	2065	≈160	4.26 0.74	$\bar{K}$N Λπ	~.35	632 819	728 726
Ξ	Ξ See Table S		1/2(1/2+)	Ξ_α	(-) 1321 (0) 1314		1.75 1.73	See Table S			
	$\Xi^0(1530)$		1/2(3/2+) p wave	Ξ_δ	(-) 1529.7 ±0.9 Xscale = 1.1	7.5 ±1.7	2.34 0.02	Ξπ	≈ 100	73	148
	$\Xi^0(1816)$		1/2(3/2−)	Ξ_γ	1816 ±3	≈ 16 ±4 Xscale=2.2	3.29 0.06	$\Xi^0\pi$ $\bar{\Lambda}\bar{R}$ Ξπ Ξππ	≈ 25 ≈ 65 ≈ 5 ≈ 5	149 205 362 222	232 394 413 312
	$\Xi^0(1933)$		1/2(5/2+)	Ξ	1933 ±16	140 ±35	3.74 0.54	Ξπ		473	501
Ω	Ω⁻ See Table S		0(3/2+)	Ω_δ	1675 ±3		2.81	See Table S			

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TABLE VII

CLEBSCH-GORDAN COEFFICIENTS AND SPHERICAL HARMONICS

Note: A $\sqrt{\ }$ is to be understood over every coefficient; e.g., for -8/15 read $-\sqrt{8/15}$.

Notation: J J ... / M M ... / m_1 m_2 / Coefficients

$Y_1^0 = \sqrt{\frac{3}{4\pi}} \cos\theta$

$Y_1^1 = -\sqrt{\frac{3}{8\pi}} \sin\theta\, e^{i\phi}$

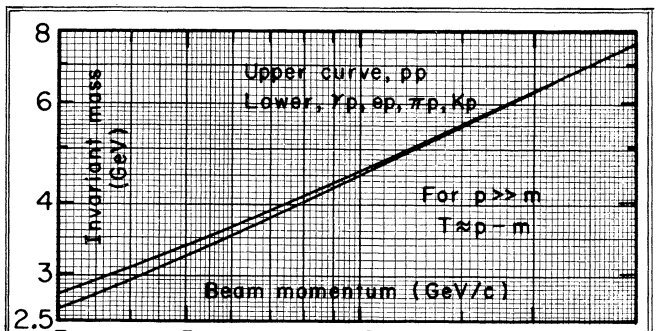
$Y_2^0 = \sqrt{\frac{5}{4\pi}} \left(\frac{3}{2}\cos^2\theta - \frac{1}{2}\right)$

$Y_2^1 = -\sqrt{\frac{15}{8\pi}} \sin\theta\cos\theta\, e^{i\phi}$

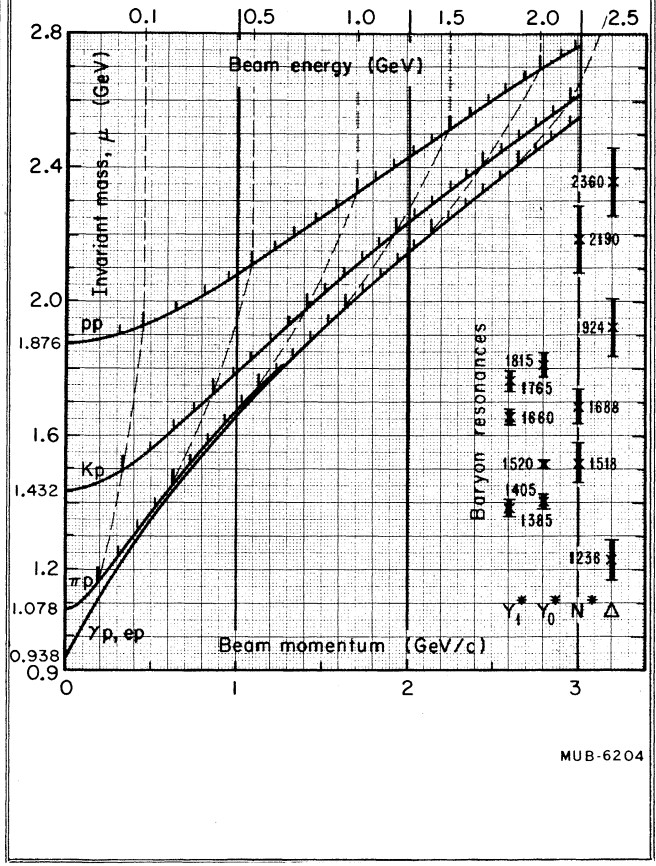
$Y_2^2 = \frac{1}{4}\sqrt{\frac{15}{2\pi}} \sin^2\theta\, e^{2i\phi}$

$Y_l^{-m} = (-1)^m Y_l^{m*}$

MU-28363



MUB-6203



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DATA ON BARYON RESONANCES Cont'd.

CODE EVENT QUANTITY ERROR+ ERROR- REFERENCE YR TECHNIQUE. IN PEAK

• INDICATES DATA IGNORED BY PROGRAMS

Δ(1236)

31 N*3/2 (1236 JP=3/2+) I=3/2

31 N*3/2(1236) MASS (MEV)

U31M	1238.0			DE HOFFMANN	54	RVUE	
U31M •	1236.1	0.3		KLEPIKOV	60	RVUE	
U31M	1234.0			ROPER	64	RVUE	
U31M	1236.45	0.65		OLSSON	64	RVUE	0
U31M	1236.0	0.55		OLSSON	64	RVUE	++
U31M	1232.0	6.0		FERRO-LUZZI	65	HBC	

31 N*3/2(1236) WIDTH (MEV)

U31W •	42.8	LOWER HALF WIDTH		DE HOFFMANN	54	RVUE	
U31W •	118.9	5.9		KLEPIKOV	60	RVUE	
U31W	120.0	2.0		OLSSON	64	RVUE	++
U31W	119.6	2.4		OLSSON	64	RVUE	0
U31W •	82.0	UPPER HALF WIDTH		VIK	63	CNTR	
U31W	145.0	14.0		GIDAL	65	DBC	- 3BODY FIN.ST.
U31W	125.0	30.0		FERRO-LUZZI	65	HBC	

31 N*3/2(1236) MASS.DIFF. (-) - (++) (MEV)

U31D1	7.9	6.8		GIDAL	65	DBC	

31 N*3/2(1236) MASS DIFF. (0) - (++) (MEV)

U31D2	0.45	0.85		OLSSON	64	RVUE	

31 N*3/2(1236) HALF WIDTH DIFF.(-)-(++) (MEV)

U31D1•W	25.0	23.0		GIDAL	65	DBC	

31 N*3/2(1236) PARTIAL DECAY MODES

U31P1	N*312(1236) INTO N PI	S16S 8

Δ(1640)

32 N*3/2 (1640,JP=) I=3/2

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

32 N*3/2(1640) MASS (MEV)

U32M •	1680.0	APPROX		CARRUTHERS	60	RVUE	
U32M •	1632.0	APPROX		DEVLIN	62	CNTR	
U32M	1648.0	12.0		DEVLIN	65	CNTR	

32 N*3/2(1640) WIDTH (MEV)

U32W •	51.0	22.0	LOWER HALF	DEVLIN	65	CNTR	
U32W •	150.0	71.0	UPPER HALF	DEVLIN	65	CNTR	

32 N*3/2(1640) PARTIAL DECAY MODES

U32P1	N*3/2(1640) INTO N PI	S16S 8

32 N*3/2(1640) BRANCHING RATIOS

U32R1•	N*3/2(1640) INTO (N PI)/TOTAL						(P1)/TOTAL
U32R1	0.56			DEVLIN	65	CNTR	

Δ(1920)

33 N*3/2 (1920,JP=7/2+) I=3/2

33 N*3/2(1920) MASS (MEV)

U33M	1922.0			DEVLIN	62	CNTR	
U33M	1926.0			AUVIL	64	RVUE	
U33M	1900.0	9.0		DEVLIN	65	CNTR	

33 N*3/2(1920) WIDTH (MEV)

U33W •	109.0	LOWER HALF WIDTH		AUVIL	64	RVUE	
U33W •	58.6	HIGHER HALF WIDTH		AUVIL	64	RVUE	
U33W •	126.0	31.0	LOWER HALF	DEVLIN	65	CNTR	
U33W •	130.0	24.0	UPPER HALF	DEVLIN	65	CNTR	

33 N*3/2(1920) PARTIAL DECAY MODES

U33P1	N*1/2(1920) INTO N PI	S16S 8
U33P2	N*1/2(1920) INTO SIGMA K	S19S10

33 N*3/2(1920) BRANCHING RATIOS

U33R1•	N*3/2(1920) INTO (N PI)/TOTAL						(P1)/TOTAL
U33R1	0.67			AUVIL	64	RVUE	
U33R1	0.57			DEVLIN	65	CNTR	

Δ(2360)

34 N*3/2 (2360,JP=9/2-) I=3/2

SPIN,PARITY ASSIGNMENT NOT FINAL

34 N*3/2(2360) MASS (MEV)

U34M	2360.0			DIDDENS	63	CNTR	
U34M	2440.			HOHLER	64	RVUE	
U34M •	2400.0	APPROX		WAHLIG	64	SPRK	0

34 N*3/2(2360) WIDTH (MEV)

U34W	200.0			DIDDENS	63	CNTR	

34 N*3/2(2360) PARTIAL DECAY MODES

U34P1	N*3/2(2360) INTO N PI	S16S 8
U34P1•	PI P FRACTION BASED ON GUESS THAT J=9/2	

Δ(2825)

36 N*3/2 (2825,JP=11/2+) I=3/2

36 N*3/2 (2825) MASS (MEV)

U36M	2825.0	15.0		CITRON	64	CNTR	
U36M	2870.			HOHLER	64	RVUE	
U36M •	2700.0	APPROX		WAHLIG	64	SPRK	0

36 N*3/2 (2825) WIDTH (MEV)

U36W	260.0			CITRON	64	CNTR	

36 N*3/2 (2825) PARTIAL DECAY MODES

Y_0^*(1405)

37 Y*0 (1405,JP=) I=0

37 Y*0(1405) MASS (MEV)

U37M	1405.0			ALSTON	62	HBC	
U37M	1405.0			ALEXANDER	62	HBC	

37 Y*0(1405) WIDTH (MEV)

U37W	50.0			ALSTON	62	HBC	
U37W	35.0	5.0		ALEXANDER	62	HBC	

37 Y*0(1405) PARTIAL DECAY MODES

U37P1	Y*0(1405) INTO SIGMA PI	S19S 8
U37P2	Y*0(1405) INTO LAMBDA 2PI	S18S 8S 8

37 Y*0(1405) BRANCHING RATIOS

U37R1•	Y*0(1405) INTO (LAMBD 2PI)/(SIGMA PI)						(P2)/(P1)
U37R1•	0.01	OR LESS		HUWE	65	HBC	

REFERENCES ON BARYON RESONANCES Cont'd.

IDENTIFIC.	YR	AUTHORS	JOUR.VOL	PAGE	YR	INSTITUTION	COD

Δ(1236)

31 N*3/2 (1236,JP=3/2+) I=3/2

DE HOFFMANN	54	RVUE F DE HOFFMANN +	PR	95	1587	54	RVUE U31
KLEPIKOV	60	RVUE N P KLEPIKOV +	REPORT	D584		60	DUBNA U31
VIK	63	CNTR O T VIK,H R RUGGE	PR	129	2311	63	L R L U31
OLSSON	64	RVUE M.G.OLSSON	PREPRINT			64	WISCONSIN U31
FERRO-LUZZI	65	HBC FERRO-LUZZI,GEORGE+	NC	36	1101	65	CERN U31
GIDAL	65	DBC GIDAL,KERNAN,KIM	UCRL	16096		65	L R L U31

Δ(1640)

32 N*3/2 (1640,JP=) I=3/2

CARRUTHERS	60	RVUE P CARRUTHERS	PRL	4	303	60	RVUE U32
DEVLIN	62	CNTR DEVLIN,MOYER,PEREZMENDEZ	PR	125	690	62	L R L U32
		AND J HELLAND +	PR	134	B1079	64	LRL 432
DEVLIN	65	CNTR DEVLIN,SOLOMON,BERTSCH	PRL	14	1031	65	PRINCETON U32

Δ(1920)

33 N*3/2 (1920,JP=7/2+) I=3/2

DEVLIN	62	CNTR DEVLIN,MOYER,PEREZMENDEZ	PR	125	690	62	L R L U33
		AND J HELLAND +	PR	134	B1079	64	LRL U33
AUVIL	64	RVUE P AUVIL,C LOVELACE	NC	33	473	64	IMPER.COLLEGE U33
DEVLIN	65	CNTR DEVLIN,SOLOMON	PRL	14	1031	65	PRINCETON U33

Δ(2360)

34 N*3/2 (2360,JP=9/2-) I=3/2

SPIN,PARITY ASSIGNMENT NOT FINAL

DIDDENS	63	CNTR A N DIDDENS +	PRL	10	262	63	B N L U34
HOHLER	64	RVUE G.HOHLER + J.GIESECKE	PL	12	149	64	KARLSRUHE U34
WAHLIG	64	SPRK M.A.WAHLIG	PRL	13	103	64	MIT U34

QUANTUM NUMBER DETERMINATION NOT REFERRED TO IN DATA CARDS U34

DONNACHIE	64	RVUE DONNACHIE+HAMILTON	ANP	31	410	65	UCL , J,P U34
		PREVIOUS ASSIGNMENT BASED ON DISPERSION RELATION CALCULAT.					U34

Δ (2825)

36 N*3/2(2825,JP=11/2+) I=3/2

SPIN,PARITY ASSIGNMENT NOT FINAL

WAHLIG	64	SPRK M.A.WAHLIG	PRL	13	103	64	MIT U36
CITRON	64	CNTR A CITRON +	PRL	13	205	64	BNL U36
HOHLER	64	RVUE G.HOHLER + J.GIESECKE	PL	12	149	64	KARLSRUHE U36

QUANTUM NUMBER DETERMINATION NOT REFERRED TO IN DATA CARDS U36

DONNACHIE	64	RVUE DONNACHIE+HAMILTON	ANP	31	410	65	UCL , J,P U36
		PREVIOUS ASSIGNMENT BASED ON DISPERSION RELATION CALCULAT.					U36

Y_0^*(1405)

37 Y*0 (1405,JP=) I=0

ALSTON	61	HBC M H ALSTON +	PRL	6	698	62	L R L U37
ALEXANDER	62	HBC G ALEXANDER +	PRL	8	447	62	L R L U37
ALSTON	62	HBC M H ALSTON +	CERN		311	62	L R L U37

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS

ABRAMS	65	HBC ABRAMS,SECHI-ZORN	BAPS	14	29	65	MARYLAND J,P U37
KIM	65	HBC JAE KWAN KIM	PRL	14	29	65	COLUMBIA J,P U37
ENGLER	65	HBC ENGLER,FISK,KRAEMER +	PRL	15	224	65	JP U37
SAKITT	65	HBC SAKITT,DAY,GLASSER +	PREPRINT			65	MARYLAND J,P U37

DATA ON BARYON RESONANCES Cont'd.

CODE EVENT QUANTITY ERROR* ERROR- REFERENCE YR TECHNIQUE*
IN PEAK

* INDICATES DATA IGNORED BY PROGRAMS

$Y_0^*(1520)$

38 Y*0 (1520,JP=3/2-) I=0

98 Y*0(1520) MASS (MEV)

U38M		1519.4	2.0		FERRO-LUZZI	62	HBC
U38M	145	1517.0	3.0		GALTIERI	63	DBC
U38M		1520.0	4.0		ALMEIDA	64	HBC

38 Y*0(1520) WIDTH (MEV)

U38W	16.0	2.0		FERRO-LUZZI	62 HBC

38 Y*0(1520) PARTIAL DECAY MODES

U38P1	Y*(1520) INTO SIGMA PI		S19S 8
U38P2	Y*(1520) INTO KBAR N		S12S17
U38P3	Y*(1520) INTO LAMBDA PI* PI-		S18S 8S 8

38 Y*0(1520) BRANCHING RATIOS

U38R1*	Y*0(1520) INTO SIG PI					(P1)/TOTAL
U38R1	0.546	0.067		WATSON	63	HBC
U38R2*	Y*0(1520) INTO K N					(P2)/TOTAL
U38R2	0.293	0.035		WATSON	63	HBC
U38R3*	Y*0(1520) INTO LAMBDA PI PI					(P3)/TOTAL
U38R3	0.16	0.02		WATSON	63	HBC

$Y_0^*(1815)$

39 Y*0 (1815,JP=5/2) I=0

39 Y*0(1815) MASS (MEV)

U39M	1815.0		CHAMBERLAIN	62	CNTR
U39M	1815.0	5.0	FERRO-LUZZI	65	HBC

39 Y*0(1815) WIDTH (MEV)

U39W	120.0		CHAMBERLAIN	62	CNTR
U39W	70.0		GALTIERI	63	HBC
U39W	45.0	5.0	FERRO-LUZZI	65	HBC

39 Y*0(1815) PARTIAL DECAY MODES

U39P1	Y*0(1815) INTO KBAR N		S12S17
U39P2	Y*0(1815) INTO SIGMA PI		S19S 8
U39P3	Y*0(1815) INTO LAMBDA PI* PI-		S18S 8S 8
U39P4	Y*0(1815) INTO LAMBDA ETA		S18S14
U39P5	Y*0(1815) INTO Y1(1385)+PI		U43S 8

39 Y*0 (1815) BRANCHING RATIOS

U39R1*	Y*0(1815) INTO (KBAR N)/TOTAL					(P1)/TOTAL
U39R1*	0.8	APPROX.		WOHL	64	HBC
U39R1*	0.70	APPROX.		FERRO-LUZZI	65	HBC
U39R2*	Y*0(1815) INTO(SIGMA PI)/TOTAL					(P2)/TOTAL
U39R2*	0.09	APPROX.		FERRO-LUZZI	65	HBC
U39R3*	Y*0(1815) INTO(LAMBDA 2PI)/TOTAL					(P3)/TOTAL
U39R4*	Y*0(1815) INTO (LAMBDA ETA)/TOTAL					(P4)/TOTAL
U39R4*	0.01	APPROX.		FERRO-LUZZI	65	HBC
U39R5*	Y*0(1815) INTO (Y1(1385)+PI)/TOTAL					(P5)/TOTAL
U39R5*	0.15	APPROX.		FERRO-LUZZI	65	HBC

$Y_0^*(2299)$

40 Y*0 (2299,JP=) I=0

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

40 Y*0(2299) MASS (MEV)

U40M	2245.0	25.0	BLANPIED	65	CNTR
U40M	2299.0		BOCK	65	HBC

40 Y*0(2299) WIDTH (MEV)

U40W	150.0		BLANPIED	65	CNTR

40 Y*0(2299) PARTIAL DECAY MODES

U40P1	Y*0(2299) INTO K N PI	S10S16S 8

$Y_1^*(1385)$

43 Y*1 (1385,JP=3/2+) I=1

43 Y*1(1385) MASS (MEV)

U43M		1385.0			ALSTON	60	HBC
U43M		1382.0	3.0		DAHL	61	HBC
U43M	378	1376.0	3.0		ELY	61	PBC
U43M		1384.0			MARTIN	61	HBC
U43M	85	1392.0	7.0		COLLEY	62	PBC
U43M	51	1388.0			COOPER	62	HBC
U43M	76	1380.0	3.0		BERTANZA	63	HBC
U43M	106	1381.0	4.0		CURTIS	63	SPRK
U43M	200	1392.0	6.2		COOPER	64	HBC
U43M	170	1375.0	3.9		COOPER	64	HBC
U43M	80	1384.0	4.0		FOELSCHE	64	HBC
U43M	803	1385.3	1.5		HUWE	64	HBC
U43M	681	1381.0	1.6		HUWE	64	HBC
U43M		1382.0	1.0		ARMENTEROS	65	HBC
U43M		1384.0	1.0		ARMENTEROS	65	HBC

43 Y*1(1385) MASS DIFF. (-) - (+)

U43D	1500	4.3	2.2	HUWE	64	HBC
U43D	370	17.0	7.0	COOPER	64	HBC
U43D		2.0	1.5	ARMENTEROS	65	HBC

43 Y*1(1385) WIDTH (MEV)

U43W	154	48.0	8.0		ELY	61	PBC
U43W	239	51.0	6.5		COOPER	64	HBC
U43W	80	30.0	7.0		FOELSCHE	64	HBC
U43W	681	46.5	3.0		HUWE	64	HBC
U43W		32.0	3.0		ARMENTEROS	65	HBC
U43W	51	40.0			COOPER	62	HBC
U43W	76	50.0	10.0		BERTANZA	63	HBC
U43W		29.0			MARTIN	61	HBC
U43W	224	66.0	10.0		ELY	61	PBC
U43W	269	88.0	6.5		COOPER	64	HBC
U43W	803	62.0	7.0		HUWE	64	HBC
U43W		38.0	3.0		ARMENTEROS	65	HBC
U43W	85	80.0	20.0		COLLEY	62	PBC
U43W	106	30.0	9.0		CURTIS	63	SPRK

43 Y*1(1385) PARTIAL DECAY MODES

U43P1	Y*1(1385) INTO LAMBDA PI	S18S 8
U43P2	Y*1(1385) INTO SIGMA PI	S21S 9

43 Y*1(1385) BRANCHING RATIOS

U43R1*	Y*1(1385) INTO (SIGMA+PI)/(LAMBDA+PI)						(P2)/(P1)
U43R1		0.04	0.04		BASTIEN	61	HBC
U43R1*		0.04	0.04	OR LESS	ALSTON	62	HBC
U43R1	100	0.09	0.04		HUWE	64	HBC
U43R1		0.14	0.03		ARMENTEROS	65	HBC

$Y_1^*(1660)$

44 Y*1 (1660,JP=) I=1

44 Y*1(1660) MASS (MEV)

U44M	1685.0		ALEXANDER	62	HBC	-0
U44M	1660.0	10.0	ALVAREZ	63	HBC	+

44 Y*1(1660) WIDTH (MEV)

U44W	45.0	5.0	ALEXANDER	62	HBC -0
U44W	40.0	10.0	ALVAREZ	63	HBC +

44 Y*1(1660) PARTIAL DECAY MODES

U44P1	Y*1(1660) INTO LAMBDA PI	S18S 8
U44P2	Y*1(1660) INTO SIG PI	S21S 8
U44P3	Y*1(1660) INTO LAMBDA 2PI	S18S 8S 8
U44P4	Y*1(1660) INTO SIGMA 2PI	S21S 8S 8
U44P5	Y*1(1660) INTO KBAR N	S12S17
U44P6	Y*1(1660) INTO Y*0(1405)+PI	U37S 8

44 Y*1(1660) BRANCHING RATIOS

U44R1*	Y*1(1660) INTO LAMBDA+PI						(P1)/TOTAL
U44R1	130	0.32		ALVAREZ	63	HBC	+
U44R1*		0.07	OR LESS	BASTIEN	63	HBC	
U44R2*	Y*1(1660) INTO SIGMA +PI						(P2)/TOTAL
U44R2	130	0.27		ALVAREZ	63	HBC	+
U44R2		0.26	0.05	BASTIEN	63	HBC	
U44R3*	Y*1(1660) INTO LAMBDA+2PI						(P3)/TOTAL
U44R3	90	0.18		ALVAREZ	63	HBC	+
U44R3		0.19	0.06	BASTIEN	63	HBC	
U44R4*	Y*1(1660) INTO SIGMA +2PI						(P4)/TOTAL
U44R4	180	0.18		ALVAREZ	63	HBC	+
U44R4		0.28	0.07	BASTIEN	63	HBC	
U44R5*	Y*1(1660) INTO K-N						(P5)/TOTAL
U44R5*		0.05	OR LESS	ALVAREZ	63	HBC	+
U44R5*		0.18	0.06 OR MORE	BASTIEN	63	HBC	
U44R6*	Y*1(1660) INTO (SIGMA PI)/(LAMBDA PI)						(P2)/(P1)
U44R6*		0.86		SMITH	63	HBC	
U44R6		6.8	3.0	HUWE	64	HBC	
U44R7*	Y*1(1660) INTO (LAMBDA 2PI)/(LAMBDA PI)						(P3)/(P1)
U44R7*		0.142		SMITH	63	HBC	
U44R8*	Y*1(1660) INTO (KBAR N)/(LAMBDA PI)						(P5)/(P1)
U44R8*		0.43	0.21	SMITH	63	HBC	
U44R9*	Y*1(1660) INTO (Y*0(1405)+PI)/(SIG+2PI)						(P6)/(P4)
U44R9*	MAINLY Y*0(1405)+PI			EBERHARD	65	HBC	+

REFERENCES ON BARYON RESONANCES Cont'd.

IDENTIFIC. YR AUTHORS JOUR.VOL PAGE YR INSTITUTION COD

$Y_0^*(1520)$

38 Y*0 (1520,JP=3/2-) I=0

FERRO-LUZZI	62	HBC	M FERRO-LUZZI +	PRL	8	28	62 L R L U38
GALTIERI	63	DBC	A BARBARO GALTIERI +	PL	6	296	63 L R L U38
WATSON	63	HBC	WATSON,FERROLUZZI,TRIPP	PR	131	2294	63 L R L U38
ALMEIDA	64	HBC	S ALMEIDA,LYNCH	PL	9	204	64 CERN U38

$Y_0^*(1815)$

39 Y*0 (1815,JP=5/2+) I=0

CHAMBERLAIN	62	CNTR	O CHAMBERLAIN +	PR	125	1698	62 L R L	U39
GALTIERI	63	HBC	A BARBARO GALTIERI +	PL	6	296	63 L R L	U39
FERRO-LUZZI	65	HBC	FERRO-LUZZI +	APS-WASHINGTON		65	CERN+CHIC+HID+SAU	U39

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS

BEALL	62	SPRK	E F BEALL +	CERN	368	62	L R L	U39
			ALSO	SIENA	123	63	L R L	U39
SODICKSON	64	SPRK	L SODICKSON +	PR	133 B757	64	M I T	U39
WOHL	64	HBC	C WOHL,S WOJCICKI +	PRIV. COMM.		64	L R L	U39
BERGE	65	HDBC	BERGE,ELY,KALMUS+	UCRL	16252	65	L R L	J,P U39

$Y_0^*(2299)$

40 Y*0 (2299,JP=) I=0

BLANPIED	65	CNTR	BLANPIED,GREENBERG +	PRL	14	741	65	YALE U40
BOCK	65	HBC	BOCK,COOPER,FRENCH+	PL	17	166	65	CERN+SACLAY U40

$Y_1^*(1385)$

43 Y*1 (1385,JP=3/2+) I=1

ALSTON	60	HBC	M H ALSTON +	PRL	5	520	60 L R L	U43
DAHL	61	HBC	D DAHL +	PRL	6	142	61 L R L	U43
BASTIEN	61	HBC	BASTIEN,	PRL			61 L R L	U43
MARTIN	61	HBC	M J MARTIN,LEIPUNER +	PRL	6	283	61 YALE,BNL	U43
ELY	61	PBC	R P ELY +	PRL	7	461	61 L R L	U43
ALSTON	62	HBC	M ALSTON,ALVAREZ +	CERN		311	62 L R L	U43
COLLEY	62	PBC	D COLLEY +	PR	128	L930	62 COL+RUT	U43
COOPER	62	HBC	W A COOPER +	CERN		298	62 CERN+ZEEM+GLA	U43
BERTANZA	63	HBC	L BERTANZA +	PRL	10	176	63 BNL+SYR	U43
CURTIS	63	SPRK	L J CURTIS +	PR	132	1771	63 MICHIGAN	U43
COOPER	64	HBC	WA COOPER +	PL	8	365	64 CERN+ZEEMAN	U43
FOELSCHE	64	HBC	FOELSCHE,LOPEZ-CEPERO +	DUBNA			64 B N L	U43
HUWE	64	HBC	D Q HUWE	UCRL	11291	64	L R L	U43
ARMENTEROS	65	HBC	ARMENTEROS,FERRO-LUZZI +	PREPRINT CERN		65	CERN,HEIDEL,SAC	U43

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS

SHAFER	63	HBC	J B SHAFER +	PRL	10	179	63 J P	U43
SHAFER	64	HBC	J.B.SHAFER + D.D.HUWE	PR	136	B1372	64 LRL	U43
MALAMUD	64	HBC	E.MALAMUD + P.E.SCHLEIN	PL	10	145	64 CERN	U43

$Y_1^*(1660)$

44 Y*1 (1660,JP=) I=1

ALEXANDER	62	HBC	G ALEXANDER +	CERN		320	62 L R L	U44
ALVAREZ	63	HBC	L W ALVAREZ +	PRL	10	184	63 L R L	U44
SMITH	63	RVUE	G A SMITH	ATHENS		67	63 L R L	U44
HUWE	64	HBC	D H HUWE	UCRL	11291	64	LRL	U44
EBERHARD	65	HBC	EBERHARD,SHIVELY+	PRL	14	466	65 LRL,ILLINOIS	U44

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS

BASTIEN	63	HBC	P L BASTIEN,J P BERGE	PRL	10	188	63 I J	U44
BASTIEN	63	HBC	P L BASTIEN	UCRL	10779	63	I J	U44
TAHER	63	HBC	M TAHER-ZADEH +	PRL	11	470	63 J P	U44
WILLIS	64	HBC	W.WILLIS +	DUBNA		64	BNL	J,P U44

DATA ON BARYON RESONANCES Concluded

CODE EVENT QUANTITY ERROR+ ERROR- REFERENCE YR TECHNIQUE. IN PEAK

* INDICATES DATA IGNORED BY PROGRAMS

$Y_1^*(1765)$

45 Y*1(1765,JP=5/2) I=1

45 Y*1(1765) MASS (MEV)

U45M	1765.0	10.0		GALTIERI	63	HBC
U45M	1760.0	10.0		FERRO-LUZZI	65	HBC
U45M *	1755.0	APPROX.		YODH	65	HBC

45 Y*1(1765) WIDTH (MEV)

U45W	60.0	10.0		GALTIERI	63	HBC
U45W	90.0	10.0		FERRO-LUZZI	65	HBC
U45W *	40.0 OR MORE			YODH	65	HBC

45 Y*1(1765) PARTIAL DECAY MODES

U45P1	Y*1(1765) INTO KBAR-N	S12S17
U45P2	Y*1(1765) INTO SIGMA PI	S19S 8
U45P3	Y*1(1765) INTO LAMBDA PI	S18S 8
U45P4	Y*1(1765) INTO Y*1(1385)+PI	U43S 8
U45P5	Y*1(1765) INTO Y*0(1520)+PI	U38S 8

45 Y*1(1765) BRANCHING RATIOS

U45R1*	Y*1(1765) INTO KBAR-N				(P1)/TOTAL
U45R1*	0.6	APPROX.	GALTIERI	63	DBC
U45R1*	0.50	APPROX.	FERRO-LUZZI	65	HBC
U45R2*	Y*1(1765) INTO (SIGMA PI)/TOTAL				(P2)/TOTAL
U45R2*	0.03 OR LESS		FERRO-LUZZI	65	HBC
U45R3*	Y*1(1765) INTO (LAMBDA PI)/TOTAL				(P3)/TOTAL
U45R3*	0.16	APPROX.	FERRO-LUZZI	65	HBC
U45R4*	Y*1(1765) INTO (Y*1(1385) PI)/TOTAL				(P4)/TOTAL
U45R4*	0.10	APPROX.	FERRO-LUZZI	65	HBC
U45R5*	Y*1(1765) INTO (Y*0(1520) PI)/TOTAL				(P5)/TOTAL
U45R5*	0.10	APPROX.	FERRO-LUZZI	65	HBC

$Y_1^*(1942)$

46 Y*1 (1942,JP=) I=1

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

46 Y*1(1942) MASS (MEV)

U46M	1942.0	BOCK	65	HBC

46 Y*1(1942) PARTIAL DECAY MODES

U46P1	Y*1(1942) INTO K N PI	S10S16S 8

$Y_1^*(2070)$

47 Y*1 (2070,JP=) I=1

47 Y*1(2070) MASS (MEV)

U47M	2022.0	20.0		BLANPIED	65	CNTR 0
U47M	2097.0			BOCK	65	HBC
U47M	2065.0			WOHL	65	HBC

47 Y*1(2070) WIDTH (MEV)

U47W	120.0	20.0		BLANPIED	65	CNTR 0
U47W	38.0			BOCK	65	HBC
U47W *	180.0	APPROX.		WOHL	65	HBC

47 Y*1(2070) PARTIAL DECAY MODES

U47P1	Y*1(2070) INTO KBAR-N	S11S17
U47P2	Y*1(2070) INTO SIGMA PI	S19S 8
U47P3	Y*1(2070) INTO LAMBDA PIO	S18S 9

47 Y*1(2070) BRANCHING RATIOS

U47R1*	Y*1(2070) INTO (KBAR-N)/TOTAL					(P1)/(P1+P2+P3)
U47R1*	0.35	APPROX.	WOHL	65	HBC	

$\Xi^*(1530)$

49 XI* (1530,JP=3/2+) I=1/2

49 XI*(1530) MASS (MEV)

U49M	57 1529.0	5.0		PJERROU	62	HBC -0
U49M	20 1535.0			BERTANZA	62	HBC -0
U49M	1535.7	4.7		LONDON	64	HBC -
U49M	1528.7	1.1		LONDON	64	HBC 0
U49M	1532.0	2.0		BADIER	64	HBC

49 XI*(1530) WIDTH (MEV)

U49W * 57	7.0 OR LESS			PJERROU	62	HBC -0
U49W * 20	35.0 OR LESS			BERTANZA	62	HBC -0
U49W 100	7.0	2.0		SCHLEIN	63	HBC 0
U49W	8.5	3.0		LONDON	64	HBC -0

49 XI*(-)-XI*(0) MASS DIFF.(MEV)

U49D	66	5.7	3.0		PJERROU	65 HBC

$\Xi^*(1810)$

50 XI*(1820,JP=) I=1/2

50 XI*(1820) MASS (MEV)

U50M	20 1770.0	"		HALSTEINSLI	63	FBC -0
U50M *	1810.0	10.0		SMITH	64	HBC
U50M	1820.0	7.0		BADIER	64	HBC
U50M	1817.0	7.0		SMITH	65	HBC
U50M	1814.0	4.0		BADIER	65	HBC

50 XI*(1810) WIDTH (MEV)

U50W	20 80.0 OR LESS			HALSTEINSLI	63	FBC -0
U50W *	60.0	APPROX		SMITH	64	HBC
U50W *	60.0	APPROX		BADIER	64	HBC
U50W	12.0	4.0		BADIER	65	HBC
U50W	30.0	7.0		SMITH	65	HBC

50 XI*(1820) PARTIAL DECAY MODES

U50P1	XI*(1820) INTO XI*(1530) PI	U49S 8
U50P2	XI*(1820) INTO LAMBDA KOBAR	S18S11
U50P3	XI*(1820) INTO XI PI	S22S 9
U50P4	XI*(1820) INTO XI PI PI	S22S 8S 8

50 XI*(1820) BRANCHING RATIOS

U50R1*	XI*(1820) INTO(XI*(1530) PI)/(LAMB.KBAR)				(P1/P2)
U50R1*	0.5	OR LESS	BADIER	64	HBC
U50R1	0.26	0.14	SMITH	65	HBC
U50R2*	XI*(1820) INTO(XI PI)/(LAMB.KBAR)				(P3/P2)
U50R2*	0.1	OR LESS	BADIER	64	HBC
U50R2	0.13	0.13	BADIER	65	HBC
U50R2*	0.15	OR LESS	SMITH	65	HBC
* PREVIOUS RATIO ASSUMES EXISTENCE OF XI*(1933)					
U50R3*	XI*(1820) INTO(XI PI PI)/(LAMB.KBAR)				(P4/P2)
U50R3*	0.5	OR LESS	BADIER	64	HBC
U50R3*	0.1	OR MORE	SMITH	65	HBC
U50R3*	0.10 OR LESS		BADIER	65	HBC

$\Xi^*(1705)$

51 XI* (1705,JP=) I=1/2

51 XI*(1705) MASS (MEV)

U51M	1705.0	SMITH	65	HBC

51 XI*(1705) WIDTH (MEV)

U51W *	20.0 APPROX.	SMITH	65	HBC

51 XI*(1705) PARTIAL DECAY MODES

U51P1	XI*(1705) INTO XI PI	S22S 8
U51P2	XI*(1705) INTO LAMBDA KBAR	S18S 8

$\Xi^*(1933)$

52 XI* (1933,JP=) I=1/2

52 XI*(1933) MASS (MEV)

U52M	1933.0 16.0	BADIER	65	HBC

52 XI*(1933) WIDTH (MEV)

U52W	140.0 35.0	BADIER	65	HBC

52 XI*(1933) PARTIAL DECAY MODES

U52P1	XI*(1933) INTO XI PI	S22S 8

REFERENCES ON BARYON RESONANCES Concluded

IDENTIFIC. YR AUTHORS JOUR.VOL PAGE YR INSTITUTION CDD

$Y_1^*(1765)$

45 Y*1 (1765,JP=5/2) I=1

GALTIERI	63 DBC	A BARBARO-GALTIERI +	PL	6	296	63	L R L	U45
FERRO-LUZZI	65 HBC	FERRO-LUZZI +	APS-WASHINGTON			65	CERN+CHIC+HID+SAU	U45
YODH	65 HBC	YODH G B	PREPRINT		456	65	MARYLAND	U45

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS U45

BERGE	65 HDBC	BERGE,ELY,KALMUS +	UCRL.	16252		65	LRL JP	U45

$Y_1^*(1942)$

46 Y*1 (1942,JP=) I=1

BOCK	65 HBC	BOCK,COOPER,FRENCH+	PL	17	166	65	CERN+SACLAY	U46

$Y_1^*(2070)$

47 Y*1 (2070,JP=) I=1

BLANPIED	65 CNTR	BLANPIED,GREENBERG +	PRL	14	741	65	YALE	U47
WOHL	65 HBC	WOHL,SOLMITZ,STEVENSON	BAPS	10	529	65	L R L	U47
ALSO	65 HBC	WOHL	UCRL	16288		65	L R L	U47
BOCK	65 HBC	BOCK,COOPER,FRENCH+	PL	17	166	65	CERN+SACLAY	U47

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS U47

STEVENSON	65 HBC	STEVENSON +	BOULDER CONF.			65	LRL JP	U47

$\Xi^*(1530)$

49 XI* (1530,JP=3/2+) I=1/2

BERTANZA	62 HBC	L BERTANZA +	PRL	9	180	62	BNL+SYR	U49
PJERROU	62 HBC	G M PJERROU +	PRL	9	114	62	UCLA	U49
CONNOLLY	63 HBC	P L CONNOLLY +	SIENA		125	63	BNL+SYR	U49
SCHLEIN	63 HBC	P E SCHLEIN +	PRL	11	167	63	UCLA	U49
LONDON	64 HBC	G W LONDON +	BAPS	9	22	64	BNL+SYR	U49
BADIER	64 HBC	J.BADIER +	DUBNA	64		64	EP+SACLAY+AMST	U49
PJERROU	65 HBC	PJERROU,SCHLEIN,SLATER+	PRL	14	275	65	UCLA	U49

$\Xi^*(1810)$

50 XI*(1810,JP=) I=1/2

HALSTEINSLID	63 FBC	A HALSTEINSLID +	SIENA		173	63	BE+CE+EP+R+UC	U50
SMITH	64 HBC	G A SMITH +	PRL	13	61	64	L R L	U50
BADIER	64 HBC	J.BADIER +	DUBNA	64		64	EP+SACLAY+AMST	U50
SMITH	64 HBC	G.A.SMITH +	PRL	14	25	65	LRL	U50
BADIER	65 HBC	BADIER,DEMOULIN +	PL	16	1	65	EP+CEN+AMST	U50
SMITH	65 HBC	SMITH,LINDSEY	UCRL	16162		65	L R L	U50

$\Xi^*(1705)$

51 XI* (1705,JP=) I=1/2

SMITH	65 HBC	SMITH,LINDSEY	UCRL	16162		65	L R L	U51

$\Xi^*(1933)$

52 XI* (1933,JP=) I=1/2

BADIER	65 HBC	BADIER,DEMOULIN +	PL	16	1	65	EP+CEN+AMST	U52