Of course, there is some production by mechanisms other than that proposed here, and thus these limits may be changed somewhat.

It is of some interest to see the effect of other states in the π-π interaction on this ratio and whether, if the above mechanism is accepted, a $T=1$ "resonance" is needed. Thus, if the $T=2$ state is dominant,

$$\frac{N(\pi^- \text{ fast})}{N(\pi^- \text{ slow})}=\frac{\frac{4}{3}(\frac{1}{9})^2|a_{3/2}|^2+\frac{4}{3}(\frac{5}{18})^2|a_{1/2}|^2}{\frac{1}{3}(\frac{1}{18})^2|a_{3/2}|^2+\frac{1}{3}(\frac{5}{18})^2|a_{1/2}|^2},$$

$$16 \geq N(\pi^- \text{ fast})/N(\pi^- \text{ slow}) \geq 4, \qquad (2)$$

or if the $T=0$ is dominant,

$$\frac{N(\pi^- \text{ fast})}{N(\pi^- \text{ slow})}=\frac{\frac{4}{3}(\frac{1}{9})^2|a_{3/2}|^2+\frac{4}{3}(\frac{1}{9})^2|a_{1/2}|^2}{\frac{4}{3}(\frac{1}{9})^2|a_{3/2}|^2+\frac{4}{3}(\frac{1}{9})^2|a_{1/2}|^2}=1. \qquad (3)$$

In neither case could one obtain a predominance of slow π^- mesons.

It is interesting to note that for the $T=1$ case, the π^+ meson is always fast by the above mechanism in the reaction $\pi^- + p \rightarrow n + \pi^+ + \pi^-$.

We can also consider the total number of $\pi^+ + \pi^-$ reactions to $\pi^- + \pi^0$ reactions: we then have, for $T=1$,

$$\frac{N(\pi^+ + \pi^-)}{N(\pi^- + \pi^0)}=\frac{18}{1}\frac{[|a_{3/2}|^2+|a_{1/2}|^2]}{[|a_{3/2}|^2+13|a_{1/2}|^2]},$$

$$18 \geq N(\pi^+ + \pi^-)/N(\pi^- + \pi^0) \geq \tfrac{18}{13}. \qquad (4)$$

Experimentally, this number is found to be greater than one.

However, it should be mentioned that this model, using pion-nucleon isobars with pion-pion interaction only in $T=1$ state, allows no fast π^- to be produced in the reaction $\pi^- + p \rightarrow \pi^+ + \pi^- + n$. Correspondingly the data of reference 2 suggest that the $T=1$ pion-pion resonance is active, but that other processes are important as well.

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Note: After completion of this work, two preprints have come to our attention which contain similar ideas.[5, 6]

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[1]V. Alles Borelli, S. Bergin, E. Perez-Mendez, and P. Waloschek, Nuovo cimento 14, 211 (1959).

[2]I. Derado, G. Lütjens, and N. Schmitz, Ann. Physik 4, 103 (1959); I. Derado and N. Schmitz, Phys. Rev. (to be published).

[3]R. M. Sternheimer and S. J. Lindenbaum, Phys. Rev. 109, 1723 (1958).

[4]See L. R. Rodberg, Phys. Rev. Letters 3, 58 (1959).

[5]Franco Selleri, CERN Report No. 8511/TH 90 (to be published).

[6]I. Derado, CERN Report No. 8113 (to be published).

ERRATUM

ANALYSIS OF THE EXPERIMENTAL τ'^+ DECAY SPECTRUM AS A TEST OF THE $\Delta T=1/2$ RULE. S. Björklund, E. L. Koller, and S. Taylor [Phys. Rev. Letters 4, 424 (1960)].

Due to an error, the predicted value of the parameter $a_{T'}$ was given as -9.8. Actually, Weinberg's predicted value is $a_{T'} \approx -5.4$. Using the latter value, the question of p becoming negative does not arise. At $a_{T'} = -5.4$, the likelihood function for the experimental data is down by a factor of ~1.5 from its maximum at $a_{T'} = -7.1$. A six-division χ^2 test with $a_{T'} = -5.4$ gives $\chi^2 = 4.0$ with a probability of 0.53. Hence the previous conclusion remains unchanged: The present data, as tested by Weinberg's analysis, are consistent with a $\Delta T=1/2$ rule.