Spectra of divalent Mn in NaCl ($g=2.0022$, $A=86.6$ gauss) and in KBr ($g=2.0041$, $A=94.96$ gauss), of divalent Eu in KCl, and of trivalent Gd in $CaCl_2$ and in $SrCl_2$ will be reported in a separate paper.

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Possible Method of Measuring Magnetic Moments of *V* Particles

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It is reasonable to assume that those V particles which have a spin $I>0$ will, as a rule, be produced partially polarized with respect to their line of flight or their production plane. If their decay is observed before they have interacted with other particles or external fields, their "memory" of the polarization should remain intact and should, for V particles with $I>1/2$, lead to angular distributions of the decay products which are not isotropic. In fact, the study of such angular distributions, or some of their characteristic features, e.g., the distribution of dihedral angles between the decay planes and the production planes of V particles, has recently been discussed in detail as a promising method of determining the spins of V particles.[1–3] There are strong indications in the experiments of Fowler, Shutt, Thorndike and Whittemore[4] and of Walker and Shepard[5] that the decay planes of Λ^0's, produced in the reaction $p+\pi^-\rightarrow\Lambda^0+\theta^0$, are oriented in such a way as to form preferentially small dihedral angles with their production planes. Tentatively it thus appears that the Λ^0 has a spin $I\geqslant 3/2$.[6] If this should be confirmed it would seem possible to measure, besides the spin, the sign and magnitude of the magnetic moment of Λ^0 by studying the effect of a magnetic field on the distribution of decay planes. In the nonrelativistic limit ($v/c\ll 1$), we find that in a magnetic field of strength B, a particle with a magnetic moment μ will carry out Larmor precessions around the axis of the field with an angular frequency

$$\omega=\mu B/I\hbar,$$

in a sense determined by the sign of the magnetic moment. Any discernible characteristic of its angular distribution at decay which can be established in field free space (e.g., a plane of symmetry) will precess around the axis of the magnetic field through an angle

$$\varphi=\omega t=2.744\times 10^5\, gBt \text{ (degrees)},$$

where the gyromagnetic ratio $g=\mu/I$ (μ measured in nuclear magnetons), and t is the time (in sec) spent in the magnetic field, e.g., before entering a cloud chamber or inside one. Thus, with the perhaps optimistic, but not completely unrealistic assumptions of a magnetic field $B\approx 18\,000$ gauss, a time of flight in this field of the order of 10^{-9} sec, and a gyromagnetic ratio $g\approx 2$, we should find a precession angle $\varphi\approx 10°$.

Similar methods could be applied to obtain spins and magnetic moments of specific hypernuclei with $I>1/2$, especially if they could be produced in well-defined reactions, such as

$$K^-+He^4\rightarrow {}_{\Lambda}H^4+\pi^-,$$

or

$$K^-+He^4\rightarrow {}_{\Lambda}H^3+n, \text{ etc.}$$

Because of the smaller distances involved here, the use of more intense (pulsed[7]) magnetic fields may be considered.

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hfs Separations and hfs Anomaly in the $6\,^2P_{3/2}$ Metastable Level of Tl^{203} and Tl^{205}†

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Precision measurements at weak field of the frequency of the hfs line ($F=2$, $m_F=0\leftrightarrow F=1$, $m_F=0$) in the metastable $6\,^2P_{\frac{3}{2}}$ level of the thallium