place in air. It is of interest to study the frequency dependence of breakdown in condensed media. We propose to publish elesewhere some results of a study of breakdown in liquids.

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MAGNETIC MOMENTS OF BARYONS AND SU(6) SYMMETRY

A. I. Akhiezer and M. P. Rekalo
Physico-technical Institute, Academy of Sciences, Ukrainian S.S.R.
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The results of Sakita[1] and of Pais et al.[2] do not take account of moderately strong interaction violating SU(6) symmetry and playing an important role in mass formulas. It is therefore of interest to ascertain the influence of moderately strong interaction on the relations between the magnetic moments of baryons. We shall show that even when account is taken of moderately strong interaction the relation between $\mu(p)$ and $\mu(n)$ is conserved.

The magnetic moments of baryons, with account of moderately strong interaction, can be represented in the form

$$\bar{\psi}^{A'B'C'}[\mu_1\delta^A_{A'}\delta^B_{B'}Q^C_{C'} + \mu_2\delta^A_{A'}\delta^B_{B'}T^C_D Q^D_{C'} + \mu_3\delta^A_{A'}T^B_{B'}Q^C_{C'}]\psi_{ABC'} \qquad (1)$$

Here ψ_{ABC} (A, B, C = 1, 2, ... 6) is a symmetrical tensor of third rank, describing simultaneously a decuplet and octet of baryons in SU(6) symmetry; $Q^C_{C'}$ is a second-rank tensor that transforms relative to SU(2) x SU(3) like the term (3,8) of the regular representation

$$Q^C_{C'} = i\mu(P)(\sigma[q\varepsilon])Q^\alpha_\beta \qquad Q^\alpha_\beta = \begin{pmatrix} 2 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

where ε is the gamma-quantum polarization vector and q its momentum; $T^C_{C'}$ is a tensor corresponding to moderately strong interaction, with components that transorm like (1,8) relative to SU(2) x SU(3). Such transformation properties of the moderately-strong-interaction Hamiltonian correspond to the simplest possibility of generalizing in the SU(6) symmetry the transformation properties of the Hamiltonian of moderately strong interaction in SU(3) symmetry.

The first term in (1) determines the magnetic moments of the baryons without account of the moderately strong interaction, while the second and third correspond to allowance for moderately strong interaction

Using the expansion of ψ_{ABC} in terms of the wave functions of the baryons from the decuplet and the baryons from the octet[1],

$$\psi_{ABC} \equiv \psi_{i\alpha,j\beta,k\gamma} = D_{\alpha\beta\gamma;ijk} + \frac{1}{3\sqrt{2}}[\varepsilon_{\alpha\beta\gamma}\varepsilon_{ij}N^\delta_{\gamma,k} + \varepsilon_{\beta\gamma\delta}\varepsilon_{jk}N^\delta_{\alpha,i} + \varepsilon_{\gamma\alpha\delta}\varepsilon_{ki}N^\delta_{\beta,j}] \qquad (2)$$

we obtain with the aid of (1) the following expressions for the magnetic moments in terms of μ_1, μ_2, and μ_3:

$$\mu(p) = 3\mu_1 + 3\mu_2 + 6\mu_3, \qquad \mu(\Sigma^0) = \mu_1$$

$$\mu(n) = -2\mu_1 - 2\mu_2 - 4\mu_3, \qquad \mu(\Lambda) = -\mu_1 + 2\mu_2 - 2\mu_3,$$

$$\mu(\Sigma^+)=3\mu_1+2\mu_2+2\mu_3 \qquad \mu(\Xi^-) = -\mu_1+3\mu_2, \quad \mu_3$$

$$\mu(\Sigma^-)=-\mu_1-2\mu_2-2\mu_3 \qquad \mu(\Xi^0) = -2\mu_1+2\mu_2+4\mu_3,$$

$$\mu_t(\Sigma^0,\Lambda)+\sqrt{3}(\mu_1+\mu_2-\mu_3).$$

Eliminating μ_1, μ_2, and μ_3 from (3) we obtain the following relations between the magnetic moments:

$$\mu(\Sigma^+) + \mu(\Sigma^-) = 2\mu(\Sigma^0), \tag{4a}$$

which are the consequence of the isotopic invariance

$$\mu(n) + \mu(\Xi^0) = 2\mu(\Sigma_u), \quad \Sigma_u = (\Sigma^0 - \sqrt{3}\Lambda)/2, \tag{4b}$$

which is satisfied in SU(3) symmetry with account of moderately strong interaction, and

$$\begin{aligned} 2\mu(p) + 3\mu(n) &= 0 \\ 3\mu(n) + 3\mu(\Sigma^+) + \mu(\Lambda) + 2\mu(\Xi^0) - 2\mu(\Xi^-) &= 0, \\ \mu(\Sigma^+) + \mu(\Sigma^-) + 2\mu(\Lambda) - 2\mu(\Xi^-) + \mu(\Xi^0) &= 0, \\ 3\mu(n) + 2\mu(\Sigma^+) - 2\mu(\Sigma^-) - \mu(\Lambda) + \mu(\Xi^0) &= 0, \end{aligned} \tag{4c}$$

which is satisfied only in SU(6) symmetry.

We emphasize once more that the relation between the magnetic moments of the neutron and proton is conserved also when account is taken of moderately strong interaction with transformation properties as indicated above.

In conclusion we present the relation between the amplitudes of the radiative transitions of baryons from the decuplet to baryons from the octet, valid in SU(6) symmetry broken by a moderately strong interaction

$$M(N^{*+} \to p + \gamma) = M(N^{*0} \to n + \gamma), \tag{5a}$$

$$M(Y_1^{*-} \to \Sigma^- + \gamma) - M(Y^{*+} \to \Sigma^+ + \gamma) = 2M(Y_1^{*0} \to \Sigma^0 + \gamma),$$

$$M(Y_1^{*-} \to \Sigma^- + \gamma) = M(\Xi^{*-} \to \Xi^- + \gamma),$$

$$M(N^{*0} \to n + \gamma) - M(\Xi^{*0} \to \Xi^0 + \gamma) = 2M(Y_1^{*0} \to \Sigma^0_u + \gamma), \tag{5b}$$

$$M(N^{*+} \to p + \gamma) + M(Y_1^{*-} \to \Sigma^- + \gamma) - M(\Xi^{*0} \to \Xi^0 + \gamma) + 2M(Y_1^{*+} \to \Sigma^+ + \gamma) = 0.$$

Relation (5a) is satisfied at the level of isotropic invariance of strong interaction, relations (5b) hold in SU(3) symmetry, and relations (5c) are satisfied only in SU(6) symmetry.

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