$$g_{\Delta^{++}\Sigma^{+}_{*}} = -(1/2)\sqrt{3}\, g_{\Sigma^{+}_{*}\Xi^{0}_{*}} = g_{\Xi^{0}_{*}\Omega^{-}} \qquad (6)$$

The remaining V-multiplets which are contained in the decuplet yield relations that duplicate (6).

The author thanks I. Yu. Kobzarev, A. A. Migdal, and K. A. Ter-Martirosyan for useful discussions. It was learned after the completion of the work that formula (5) was derived by Zakharov and Kobzarev[3] using SU(3) technique.

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[3] V. I. Zakharov and I. Yu. Kobzarev, ITEF Preprint No. 298, 1965.

1) Concerning the V-spin concept, see, for example, the review [2].

TRANSFORMATION PROPERTIES OF THE WEAK INTERACTION LAGRANGIAN AND OF THE S AMPLITUDE OF HADRON DECAYS OF HYPERONS IN SU(6) SYMMETRY

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Several authors[1-3] recently derived, on the basis of SU(6) symmetry, relations between the amplitudes of the S-waves of hyperon hadron decays. These relations are in satisfactory agreement with experiment. Of particular importance is the deductions that there is no S-wave in $\Sigma^{+} \rightarrow n\pi^{+}$ decay, a deduction related in [2] to the absence of decay of a strange quark with emission of a π^{+} meson1).

It is possible to apply with sufficient justification to the S-wave amplitudes of hadron decays an SU(6) symmetry broken only by weak interaction. It is all the more important that the relations obtained in [1-3] for the S-wave, using CP invariance, are apparently "stable" against the violation of SU(6) symmetry by a moderately strong interaction which is a linear combination of the representations 38, 189, and 405 (see [4]).

The latter circumstance - the absence of definite transformation properties in an interaction that splits the SU(6) miltiplets[5] differentiates between SU(6) and SU(3), where the corresponding interaction transforms like an octet. Electromagnetic and weak currents, and apparently also the hadron weak-interaction Lagrangian, transform in accordance with analogous representations[6].

In this connection, the assumption that the hadron weak-interaction Lagrangian transforms in accordance with the representation 35 of SU(6) symmetry is to some degree arbitrary, albeit natural.

In this letter we consider the degree to which the relations between the S-amplitudes of hadron decays of hyperons, obtained in [1-3], are stable against the transformation properties of the Lagrangian (or the corresponding spurion) of hadron weak interaction.

We shall use the notation of [2].

Let a weak spurion H be an arbitrary linear combination of representations 35 (H^{α}_{β}), 189 ($H^{\alpha,\beta}_{\gamma,\delta}$), 280 + $\overline{280}$ ($H^{\alpha\beta}_{\gamma,\delta} + H^{\alpha,\beta}_{\gamma\delta}$), and 405 ($H^{\alpha\beta}_{\gamma\delta}$) of the SU(6) group (symmetry exists between adjacent indices, and antisymmetry between indices separated by a comma; greek indices run through values 1, ..., 6).

The product $\overline{56} \otimes 56$ (= $\bar{B}B$) includes, in addition to the unit representation, also the representations 25, 405, and 2695 (once each).

On the other hand, $35 \otimes 35$ (= MH) contains the representation 35 twice and 405 once.

The only representation that the products $35 \otimes 189$ and $\overline{56} \otimes 56$ have in common is 35.

The product $35 \otimes 280$ contains the representations 35 and 405 once. Finally, the product $35 \otimes 405$ contains the representation 35 once, 405 twice, and 2695 once.

The foregoing allows us to write for the matrix element of the decay $B \rightarrow B + M$

$$M = \sum_{i=1}^{10} a_i I_i \tag{1}$$

where

$$I_{1(2)} = B^{+}_{\delta\beta\gamma} B^{\alpha\beta\gamma} (M^{\sigma}_{\alpha} H^{\delta}_{\sigma} \mp M^{\delta}_{\sigma} H^{\sigma}_{\alpha})$$

$$I_3 = B^{+}_{\delta\epsilon\gamma} B^{\alpha\beta\gamma} (M^{\delta}_{\alpha} H^{\epsilon}_{\beta} + M^{\epsilon}_{\alpha} H^{\delta}_{\beta} + M^{\delta}_{\beta} H^{\epsilon}_{\alpha} + M^{\epsilon}_{\beta} H^{\delta}_{\alpha})$$

$$I_4 = B^{+}_{\delta\beta\gamma} B^{\alpha\beta\gamma} M^{\epsilon}_{\sigma} H^{\sigma,\delta}_{\epsilon,\alpha}$$

$$I_5 = B^{+}_{\delta\beta\gamma} B^{\alpha\beta\gamma} M^{\epsilon}_{\sigma} (H^{\sigma\delta}_{\epsilon,\alpha} + H^{\sigma,\delta}_{\epsilon\alpha}$$

$$I_6 = B^{+}_{\delta\epsilon\gamma} B^{\alpha\beta\gamma} (M^{\sigma}_{\alpha} H^{\epsilon\delta}_{\sigma,\beta} + M^{\sigma}_{\beta} H^{\epsilon\delta}_{\sigma,\alpha} + M^{\delta}_{\sigma} H^{\sigma}_{\alpha} + M^{\epsilon}_{\sigma} H^{\sigma,\delta}_{\alpha})$$

$$I_7 = B^{+}_{\delta\beta\gamma} B^{\alpha\beta\gamma} M^{\epsilon}_{\sigma} H^{\sigma\delta}_{\epsilon\alpha}$$

$$I_8 = B^{+}_{\delta\epsilon\gamma} B^{\alpha\beta\gamma} (M^{\delta}_{\sigma} H^{\sigma\epsilon}_{\alpha\beta} + M^{\epsilon}_{\sigma} H^{\sigma\delta}_{\alpha\beta})$$

$$I_9 = B^{+}_{\delta\epsilon\gamma} B^{\alpha\beta\gamma} (M^{\sigma}_{\alpha} H^{\delta\epsilon}_{\sigma\beta} + M^{\sigma}_{\beta} H^{\delta\epsilon}_{\sigma\alpha})$$

$$I_{10} = B^{+}_{\delta\epsilon\sigma} B^{\alpha\beta\gamma} \{M^{\delta}_{\alpha} H^{\epsilon\sigma}_{\beta\gamma}\}$$

$\{\ \}$ denotes symmetrization with respect to the corresponding upper and lower indices.

An analysis of the properties of I_i relative to charge conjugation and the requirement of CP invariance of the matrix element results in the fact that inly invariants I_1, I_8, and I_9 contribute to the S amplitudes, with $a_8 = -a_9$. In other words, only the spurions 35 (H^{α}_{β}) and 405 ($H^{\alpha\beta}_{\gamma\delta}$) will contribute to the S-wave.

The form of H^{α}_{β} is given in [2]. The condition that $H^{\alpha\beta}_{\gamma\delta}$ be a scalar of SU(2) and a sixth component of a vector in SU(3) yields

$$H^{\alpha\beta}_{\gamma\delta} \sim (T^{A}_{C}\delta^{B}_{D} + T^{B}_{D}\delta^{A}_{C})\delta^{i}_{\ell}\delta^{j}_{k} + (T^{A}_{D}\delta^{B}_{C} + T^{B}_{C}\delta^{A}_{D})\delta^{i}_{k}\delta^{j}_{\ell} \qquad (2)$$

where $T \equiv F_6$ (A, B, ... = 1, 2, 3; i, j, ... = 1, 2).

Eliminating a_1 and a_8 from (1) we obtain the following relations between the S-amplitudes of hyperon hadron decays:

$$(\Sigma^{+} \to n\pi^{+})_S = 0$$
$$(\Lambda^{0} \to p\pi^{-})_S + 2(\Xi^{-} \to \Lambda\pi^{-})_S = \sqrt{3}\,(\Sigma^{+} \to p\pi^{0})_S \qquad (3)$$
$$(\Omega^{-} \to \Xi^{0*}\pi^{-})_S = 2\sqrt{2}\,(\Lambda \to p\pi^{-})_S - \sqrt{3}\,(\Sigma^{-} \to n\pi^{-})_S$$

As expected, the deduction that there is no S wave in the $\Sigma^+ \to n^+$ decay remains in force. On the other hand, the limitations on the amplitudes become less stringent. In place of the two equations (3) of [2], which relate the S-wave amplitudes of Λ^-, Ξ^-, Σ^-, and Ω^- decay, we have the triangle relations obtained in the SU(3) symmetry scheme[6]. The latter relation, which on satisfaction of the equality

$$(\Lambda \to p\pi^-)_S = \left(\sqrt{3}/2\right) (\Sigma^- \to n\pi^-)_S$$

goes over into the equality

$$(\Lambda \to p\pi^-)_S = \frac{1}{\sqrt{2}} (\Omega^- \to \Xi^{0*}\pi^-)_S$$

obtained in [2].

The author thanks O. V. Kancheli for discussions.

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1) Such a lucid picture implies, of course, a weak effective mutual influence between the quarks, which are in a bound state in a very deep potential well.

INVESTIGATION OF A MICROWAVE ELECTROMAGNETIC WAVE IN THE SKIN LAYER OF INDIUM

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The stationary distribution of a microwave electromagnetic field outside a conductor is usually determined experimentally by means of a test body. A