

Nonrelativistic Quark Model and Octet Dominance in Cabibbo's Weak Hamiltonian.

S. NAITO

Department of Physics, Osaka City University - Osaka

(Lett. Nuovo Cimento, 8, 221 (1973))

Since (6) means that $l=l'=0$, we obtain an interesting result that *P-wave decays of hyperons are forbidden in the nonrelativistic quark model*. On the other hand, this difficulty does not occur in the nonrelativistic symmetric quark models such as the three triplet quark, the colour quark, para-quark models, etc.; in these models, we find that both l and l' are even by using the statistics, the spin property and wave functions of B_i and B_f . Furthermore, DOSS and (7) can be obtained similarly, as briefly stated in the previous footnote. While these results have already been derived by a somewhat different method (*), (9), (11), (12) and the vanishing of *P-wave decays of the Ω^- (in the nonrelativistic approximation) are the new ones.*

Finally, we comment on *t-u* dual terms. Summing up SU_3 octet mesons in the *t*-channel, we find that

$$(1) \quad P(\Lambda_-^0) + 2P(\Xi_-) = -\sqrt{\frac{3}{2}}P(\Sigma_-).$$

Together with (11), we obtain

$$(2) \quad \alpha = -\beta.$$

Then, *t-u* dual terms give

$$(3) \quad P(\Lambda_-^0):P(\Sigma_+^+):P(\Sigma_0^+):P(\Xi_-) = 1:0:-\sqrt{3}:-2,$$

which is badly in disagreement with experiment.

(*) J. C. PATI and C. H. WOO: *Phys. Rev. D*, **3**, 2920 (1971); M. GRONAU: *Phys. Rev. Lett.*, **28**, 188 (1972); *Phys. Rev. D*, **5**, 118, 1877 (Erratum) (1972); K. J. SEBASTIAN and C. A. NELSON: *Phys. Rev. D*, **8**, 3144 (1973); and various paper cited therein.