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# TEST OF AN ADDITIVE DIQUARK SPECTATOR MODEL FOR MESON BARYON QUASI TWO BODY REACTIONS

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Abstract:

Diquarks were recently introduced as building blocks of exotic states such as e.g. baryonum. In such systems diquark - (or anti-diquark- ) states are effectively generated by angular momentum barriers. There is now however evidence that even ground state (non-exotic) three-quarks states show diquark clustering. This is indicative of a three-body component in the interquark forces.

Some 75 independent results on $\sigma$, $d\sigma/dt'$ (both for NP and UP-exchange) were studied for a large group of strangeness-exchange and charge-exchange quasi-two-body reactions, for incident momenta ranging from 2.3 to 18.5 GeV/c, i.e. the processes $K^-p \to (\pi^0, \eta^0, \rho^0, \phi^0, \omega^0) + (\Lambda^0, \Sigma^0, Y^{*0}_{1385})$

$\pi^-p \to (K^0, K^{*0}) + (\Lambda^0, \Sigma^0, Y^{*0}_{1385})$

$K^-p \to (\bar{K}^0, \bar{K}^{*0}) + (n,\Delta)$

$K^0p \to (K^+, K^{*+}) + (n,\Delta)$

$\pi^-p \to (\pi^0, \rho^0, \omega^0, \eta^0) + (n,\Delta)$

All these reactions are known to be in violent disagreement with $SU_6$-predictions - sometimes as large as 300%! The main conclusion of the paper is that all these discrepancies are resolved (without spoiling the known successes of $SU_6$) if one assumes a quark-diquark substructure for the three nucleon and hyperon quarks involved. In the context of this model 'diquark' never has to mean more than a clustering of 2 (baryon) quarks 'sufficient' to avoid the complete 3-quark symmetrization required by $SU_6$. The model uses essentially only one parameter, i.e. an angle controlling the breaking of the $SU_6$-symmetry in the diquark-quark coupling (the 'diquark' itself keeps the quantum-numbers of an $SU_6$ symmetric two-quark state).

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