Type: Oral

Estimation of the mass of low-lying baryons and ground state pentaquarks

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Baryon mass spectrum has been studied over decades, but theoretical results are still largely inconsistent with experimental data. No need to mention the higher excited states, even the low-lying resonances, for example, theoretical works in the three-quark picture always predict a larger mass for the Roper resonance N(1440) than for N(1520) and N(1535). In our work Baryon masses are estimated in the constituent quark model with Cornell potential, assuming that baryons consist of the q^3 as well as $q^4\bar{q}$ pentaquark component. Numerical calculations of the multiquark mass spectrum are done with the hamiltonian in equation below. The roper resonance N(1440) and N(1535) and other low-lying q^3 baryons are interpreted, and the theoretical results of charmonium pentaquark states are in line with the candidates $P_c^+(4380)$, $P_c^+(4450)$ proposed by LHCb. Masses of pentaquark states $uudb\bar{b}$ are predicted as well.

 $\label{eq:linear} $$ H_N=\sum_{i=1}^N m^0_k+V0+\sum_{i=1}^N m^0_k+V0+\sum_{i=$

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