Systematics of the heavy flavor hadronic molecules

With a quark level interaction, we give a unified description of the loosely bound molecular systems. Using the Pc states as inputs to fix the interaction strength of light quark-quark pairs, we reproduce the observed Pcs and Tcc states and predict another narrow T'cc state with quantum numbers J=1, I=0. If we require a satisfactory description of the Tcc and Pc states simultaneously, our framework prefers the assignments of the Pc(4440) and Pc(4457) as the [Sigma_c\bar{D}]̂_{J=1/2}̂{I=1/2} and [\Sigma_c\bar{D}̂]_{J=3/2}̂{I=1/2} states, respectively. We propose the isospin criterion to explain naturally why the experimentally observed Tcc, Pc, and Pcs molecular candidates prefer the lowest isospin numbers. We also predict the loosely bound states for the bottom di-hadrons.

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