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Further study of c\bar{c}c\bar{c} system within a chiral quark model

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Inspired by the recent ATLAS and CMS experiments on the invariant mass spectrum of J/\psi J/\psi, we systematically study the c\bar{c}c\bar{c} system of J^{P}=0^{+}. In the framework of chiral quark model, we have carried out bound-state calculation and resonance-state calculation respectively by using Real-scaling method. The results of bound-state calculation show that there are no bound states in the c\bar{c}c\bar{c} with 0^{+} system. The resonance-state calculation shows that there are four possible stable resonances: R(6920), R(7000), R(7080) and R(7160). R(6920) and R(7160) are experimental candidates for X(6900) and X(7200), whose main decay channel is J/\psi J/\psi. It is important to note that the another major decay channel of R(7160) is \chi_{c0} \chi_{c0} , and the \chi_{c0} \chi_{c0} is also the main decay channel of R(7000), R(7080). Therefore, we propose to search experimentally for these two predicted resonances in the \chi_{c0} \chi_{c0} invariant mass spectrum.

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