Lattice QCD analysis of hidden-charm pentaquarks

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Recently, LHCb collaboration has reported three resonance states in the J/\psi p invariant mass spectrum from a weak decay of \Lambda_b. The states, $P_c(4312)$, $P_c(4440)$ and $P_c(4457)$, are expected to be pentaquarks with flavor structure of uudc\bar{c}. In this work, we analyze the J/\psi p scattering by lattice QCD at $m_{pi=700, 570, 410}$ MeV. We determine the spin-dependent J/\psi p potentials, as well as the coupled-channel potentials of open-charm meson-baryon systems through the HAL QCD method.

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