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Hidden-charm pentaquarks as a meson-baryon molecule with coupled-channels for Dbar-Lambda_c and Dbar-Sigma_c

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Summary

We study the hadronic molecules being realized as the coupled channel systems of $\bar{D}^{(*)}\Lambda_c$ and $\bar{D}^{(*)}\Sigma_c^{(*)}$.
In this system, the coupled channels of $\bar{D}^{(*)}\Sigma_c^{(*)}$ are important due to the heavy quark spin symmetry.
In addition, the couplings to the $\bar{D}^{(*)}\Lambda_c$ channels and to the states with nonzero orbital angular momentum are expected to provide an attraction.
The full coupled channel analysis of $\bar{D}^{(*)}\Lambda_c$ and $\bar{D}^{(*)}\Sigma_c^{(*)}$ with large orbital angular momenta has never performed so far.
By solving the coupled channel Schrodinger equations with the one meson exchange potential respecting to the heavy quark spin and chiral symmetries,
we study the hidden-charm hadronic molecules with $I(J^P) = 1/2(3/2^{\pm})$ and $1/2(5/2^{\pm})$.
We conclude that the J^P assignment of the observed pentaquarks by LHCb collaboration is $3/2^+$ for $P_c(4380)$ and $5/2^-$ for $P_c(4450)$.
In addition, we give predictions for the $J^P = 3/2^{\pm}$ states.

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