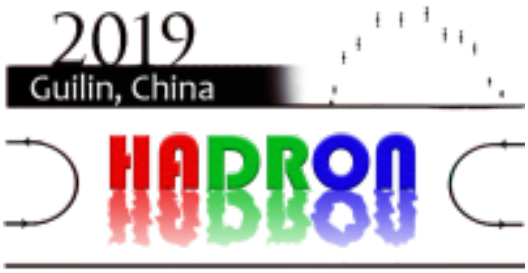

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Decay behaviors of possible $\Lambda_{c\bar{c}}$ states in hadronic molecule pictures

In 2010, $\Lambda^*_{c\bar{c}}$ states were predicted as the strange number $S = -1$ partners of $N^*_{c\bar{c}}$, which are well known now as the P_c states and observed experimentally by LHCb Collaboration. We analyze the decay behaviors of $\Lambda_{c\bar{c}}$ as S-wave hadronic molecules within the effective Lagrangian framework by a similar method, which has been applied on P_c states successfully. partial widths of possible decay channels calculated, we find that $\Lambda_{c\bar{c}}(4213)$ and $\Lambda_{c\bar{c}}(4403)$, which are formed as pseudoscalar meson baryon molecules, mainly decay to the $\eta_c\Lambda$ channel. For the two vector meson baryon molecule states, our results show that the total decay width with $J^P = \frac{1}{2}^-$ is by one order of magnitude larger than that with $J^P = \frac{3}{2}^-$. The decay patterns and relative decay ratios are very different for $\Lambda_{c\bar{c}}(4370)$ being a $D_s^{*-}\Lambda_c^+$ or $\bar{D}^*\Xi_c$ molecule state. The main decay channels of $\Lambda_{c\bar{c}}(4550)$ are $\bar{D}^{(*)}\Xi_c^{(*,\prime)}$ because of the pseudoscalar meson exchange mechanism. In addition, $\bar{D}^*\Xi_c$ is the dominant decay channel of $\Lambda_{c\bar{c}}(4490)$ which is assumed as a $\bar{D}\Xi_c^*$ bound state. These decay patterns of the $\Lambda^*_{c\bar{c}}$ states would provide a guidance for their future experimental searches and help us to understand their internal structures.

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