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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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