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NDD^* three-body molecular states

Tuesday, 9 July 2024 11:00 (30 minutes)

We start from the assumption that the $\Lambda_c(2940)$ and $\Lambda_c(2910)$ correspond mostly to D^*N bound states with $J^P = 1/2^-$ and $3/2^-$, respectively. Then, adding a D meson as a third particle, and assuming that the DN and DD^* interactions are mainly dominated by the $\Lambda_c(2765)$ and $T_{cc}(3875)$ resonances, we look for the possible binding of the D^*DN three body system within the framework of the Fixed Center Approximation. We find one state for each spin channel with a binding of about 60 MeV with respect to the $\Lambda_c(2940)D$ and $\Lambda_c(2910)D$ thresholds and a width of about 90 MeV. As an alternative picture we also study the system as a cluster of DN and a D^* meson interacting on the cluster, and find similar results. The observation of these $J^P = 1/2^+$, $3/2^+$ states would provide new and valuable information concerning the DN and D^*N interaction, a topic of current interest.

session

B. Hadron Spectroscopy

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