

$\Xi_c - \Xi'_c$ mixing From Lattice QCD

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In heavy quark limit, the lowest-lying charmed baryons with two light quarks can form an SU(3) triplet and sextet. The Ξ_c in the SU(3) triplet and Ξ'_c in the sextet have the same J^{PC} quantum number and can mix due to the finite charm quark mass and the fact the strange quark is heavier than the up/down quark. We explore the Ξ_c - Ξ'_c mixing by calculating the two-point correlation functions of the Ξ_c and Ξ'_c baryons from lattice QCD. Based on the lattice data, we adopt two independent methods to determine the mixing angle between Ξ_c and Ξ'_c . After making the chiral and continuum extrapolation, it is found that the mixing angle θ is $1.2^\circ \pm 0.1^\circ$, which seems insufficient to account for the large SU(3) symmetry breaking effects found in weak decays of charmed baryons.

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