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The axial-vector transitions between the singly charmed baryons within a mean-field approach

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A chiral quark-soliton model (CQSM) is a relativistic pion mean-field approach in the large N_c limit, which describes baryon as a bound state of the N_c valence quarks by the pion mean field. In the infinitely heavy mass limit of the heavy quark, a singly heavy baryon can be viewed as an $N_c - 1$ chiral soliton with the heavy quark as a static color source. In this framework, we evaluate the axial-vector transition form factors of the low-lying singly charmed baryons. The $1/N_c$ rotational corrections and the effects of flavor SU(3) symmetry breaking were taken into account. We investigate the contributions from the valence and sea quarks to the axial-vector transition form factors and, the valence-quark contributions are dominant in all transition processes. Moreover, we find that the effects of flavor SU(3) symmetry breaking are marginal in general.

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