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Spectroscopy of charmed baryons from lattice QCD

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We present the ground and excited state spectra of triply, doubly and singly-charmed baryons by using dynamical lattice QCD. A large set of baryonic operators that respect the symmetries of the lattice and are obtained after subduction from their continuum analogues are utilized. Using novel computational techniques correlation functions of these operators are generated and the variational method is exploited to extract excited states. The lattice spectra that we obtain have baryonic states with well-defined total spins up to $\frac{7}{2}$ and the low lying states remarkably resemble the expectations of quantum numbers from $SU(6) \times O(3)$ symmetry. Various energy splittings between the extracted states, including splittings due to hyperfine as well as spin-orbit coupling, are considered and those are also compared against similar energy splittings at other quark masses.

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