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Study of the spectra and decay widths of heavy single baryons

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We present a study of the spectra and strong decay widths of heavy baryons. The masses of single heavy baryons up to the D-wave are calculated within a constituent quark model, employing both the three-quark and quark-diquark schemes. We calculated the decay widths of the ground and excited single heavy baryons into the charmed baryon-(vector/pseudoscalar) meson pairs and the (octet/ decuplet) baryon-(pseudoscalar/vector) charmed meson pairs. Moreover, we discuss why the presence or absence of the ρ-mode excitations in the experimental spectrum is the key to distinguishing between the quark-diquark and three-quark behaviors, as was originally pointed out in [1].
Our quantum number assignments and predictions for mass spectra and strong-decay widths are in agreement with the available data. Hence, our findings provide valuable guidance for future measurements in experiments conducted at LHC, Belle, and Belle II.

[1] E.~Santopinto, A.~Giachino, J.~Ferretti, H.~Garc{\'i}a-Tecocoatzi, M.A. Bedolla, R.~Bijker, E.~Ortiz-Pacheco, The European Physical Journal C 79(12), 1012 (2019).

Parallel Session

Hadron Spectroscopy

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