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Spin-parity assignment and decay property of Ω_b baryon

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In 2020, there are four narrow states of Ω_b baryon listed by Particle Data Group (PDG) [1], having one-star status, which have no confirmed J^P value. The resonance masses are: $\Omega_b(6315)^-$, $\Omega_b(6330)^-$, $\Omega_b(6340)^-$, and $\Omega_b(6350)^-$. Using the hypercentral approach, we enumerated masses of the excited states of Ω_b baryon. In Hypercentral Constituent Quark Model (hCQM), the screening potential is employed as confining potential with color-Coulomb potential. We determine the possible J^P values for these four newly observed Ω_b states and compared them with results obtained by other theoretical approaches. Furthermore, the properties of Ω_b baryon have been studied. The ground state magnetic moment (spin $\frac{1}{2}$ and $\frac{3}{2}$), transition magnetic moment, radiative decay width and strong decay width are calculated using the enumerated mass spectra.

References:

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Session

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