Prediction of Bottom Baryons Mass Spectrum

In recent years, heavy baryons were almost completely discovered. The remaining baryons that have not been discovered are only bottom baryons Ω_b^{*-}, Σ_b^{*0}, Ξ_b^{*-}, Σ_b^{0}, $\Xi_b^{'0}$, $\Xi_b^{'-}$ and $\Xi_b^{'-}$. This study is to predict mass spectrum of bottom baryons in s-wave using a constituent quark model with non-relativistic quantum mechanics and spin-spin interaction. The calculation results are compared with the experimental data of known heavy baryons using the absolute relative errors as an indicator of prediction accuracy. The seven-parameters optimization, including constituent quark masses, is adjusted to achieve the minimum of the absolute relative errors. We obtain the results of mass spectrum within 0.001 of experimental values. Consequently, the derived model can be used to predict the masses of six aforementioned bottom baryons.

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