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A study of bottom baryons with extended local hidden gauge approach

In present work we investigate the interaction of $\bar{B}N$, $\bar{B}\Delta$, \bar{B}^*N and $\bar{B}^*\Delta$ states, together with their coupled channels. We consider the heavy quark spin symmetry for pion exchange and reproduces the results of the Weinberg Tomozawa term, coming from light vector exchanges in the extended local hidden gauge approach. With this dynamics we search states dynamically generated from the interaction and find two states with small width, which we associate to the $\Lambda_b(5912)$ and $\Lambda_b(5920)$ states. The states couple mostly to \bar{B}^*N , which are degenerate with the Weinberg Tomozawa interaction. The difference of masses between these two states, with $J = 1/2, 3/2$ respectively, is due to pion exchange connecting these states to intermediate $\bar{B}N$ states. In addition to these two Λ_b states, we find three more states with $I = 0$, one of them nearly degenerate in two states of $J = 1/2, 3/2$. Furthermore we also find eight more states in $I = 1$, two of them degenerate in $J = 1/2, 3/2$, and other two degenerate in $J = 1/2, 3/2, 5/2$.

Summary

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