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The spin structure of pentaquark states

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Since $P_c(4380)$ and $P_c(4450)$ were discovered by LHCb collaboration in 2015, the nature of two pentaquarks is still veiled. Recently, three pentaquark states, $P_c(4312)$, $P_c(4440)$, $P_c(4457)$ were discovered by LHCb with more precision, which inspired us to explore the nature of three pc states. In this talk, I will discuss the implementation of effective field theory to describe the three pentaquark states $P_c(4312)$, $P_c(4440)$, $P_c(4457)$ in terms of molecular picture, and also compared our results with one boson exchange model to analysis the issue of spin of $P_c(4440)$ and $P_c(4457)$, besides a series of molecular states emerged in a complete heavy-quark spin symmetry multiplet of charmed mesons and baryons are also presented.

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