Contribution ID: **23** Type: **not specified**

Fully heavy tetraquark bc\bar{b}\bar{c}

We study the existence of fully-heavy hidden-flavor $bc\bar{b}\bar{c}$ tetraquark states with various $J^{PC} = 0^{\pm+}, 0^{--}, 1^{\pm\pm}, 2^{++}$, by using the moment QCD sum rule method augmented by fundamental inequalities. Using the moment sum rule analyses, our calculation shows that the masses for the S-wave positive parity $bc\bar{b}\bar{c}$ tetraquark states are about $12.2 - 12.4$ GeV in both $[\mathbf{3_c}]_{bc} \otimes [\mathbf{3_c}]_{\bar{b}\bar{c}}$ and $[\mathbf{6_c}]_{bc} \otimes [\mathbf{6_c}]_{\bar{b}\bar{c}}$ color configuration channels. Except for two 0^{++} states, such results are below the thresholds $T_{\eta_c\eta_b}/T_{\Upsilon\psi}$ and $T_{B_cB_c}$, implying that these S-wave positive parity $bc\bar{b}\bar{c}$ tetraquark states are probably stable against the strong interaction. For the P-wave negative parity $bc\bar{b}\bar{c}$ tetraquarks, their masses in the $[\mathbf{3_c}]_{bc} \otimes [\mathbf{3_c}]_{\bar{b}\bar{c}}$ channel are around $12.9 - 13.2$ GeV, while a bit higher in the $[\mathbf{6_c}]_{bc} \otimes [\mathbf{6_c}]_{\bar{b}\bar{c}}$ channel. They can decay into the $c\bar{c} + b\bar{b}$ and $c\bar{b} + b\bar{c}$ final states via the spontaneous dissociation mechanism, including the $J/\psi\Upsilon$, $\eta_c\Upsilon$, $J/\psi\eta_b$, $B_c^+B_c^-$ channels.

Presentation type

Oral

Primary author: Mr YANG, Zi-Yan (School of Physics, Sun Yat-Sen University)

Presenter: Mr YANG, Zi-Yan (School of Physics, Sun Yat-Sen University)