

Search for charged exotic hadrons at Belle II

Content

The search for exotic hadrons has overgrown since the first observation by the Belle collaboration in 2003, when observed a like-resonant structure in the exclusive decay $B \rightarrow X^{\{0\}}K \rightarrow (J/\psi\pi^{\{+\}}\pi^{\{-\}})K$. This state X does not match with the known charmonium states and the possibility of being an exotic state was considered. Its charged partner was searched in $X^{\{-\}} \rightarrow J/\psi\pi^{\{-\}}\pi^{\{0\}}$ but not found, rejecting the tetraquark hypothesis. The $X^{\{0\}}$ was also produced directly from hard pp collisions, which discard the molecular hypothesis. Additional hypothesis were considered but subsequently discarded. Therefore, the true nature is still unknown and represents a milestone in HEP; a wider understanding about how quarks actually interact would be valuable to QCD. Our main objective is to search any possible charged exotic states in the exclusive decay $B \rightarrow X^{\{-\}}K \rightarrow (J/\psi\pi^{\{-\}}\pi^{\{0\}})K$, but now in the whole spectrum and using the full Belle II data with new techniques as Amplitude Analysis. For this event, we will show the distribution of some important kinematical variables, useful to understand the nature of any charged like-resonant structures in this channel, as well as historical, theoretical and experimental discussions.

Summary

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