

Study of exotic tetraquark states in B-meson decays at the ATLAS experiment

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Search and study of multi-quark XYZ states is one of the urgent tasks of modern high energy physics. Calculations obtained using Lattice QCD cannot fully describe spectrum of those states and predict parameters of currently unopened states. Studying the properties of exotic hadrons can bring us to a better understanding of the strong interaction. In this report, results of the amplitude analysis of $B^0 \rightarrow J/\psi K\pi$, $B_s \rightarrow J/\psi K K$ decays at the ATLAS experiment at the LHC are presented. The analysis is based on a sample of pp collision data at the center of mass energies $\sqrt{s} = 13$ TeV corresponding to integrated luminosity of 139 fb^{-1} . Contributions from the exotic states $Z_c^\pm(4200)$, $Z_c^\pm(4430)$, $Z_c^\pm(3900)$, $Z_{cs}^\pm(4000)$, $Z_{cs}^\pm(4220)$ to the above mentioned decays are observed with a total significance above 10σ . The report also contains study of various spin-parity options of $Z_c^\pm(4200)$ state.

Primary author: VASYUKOV, Artem (JINR)

Presenter: VASYUKOV, Artem (JINR)

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