

Search for Exotics in B decays at LHCb

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The spectroscopic studies of heavy hadrons in the charmonium or bottomonium sector are crucial in providing powerful insights into the intricacies of quantum chromodynamics (QCD) in the non-perturbative regime. QCD, becomes highly non-perturbative at the scales typical of hadron size, hence describing these hadrons as bound quark systems from first principles is challenging. Experimental observations have driven some progress, leading to the discovery of nearly 30 exotic hadron candidates. It is the pattern of one unexpected result after another, with the emergence of desperately few connections, that has characterized the last 20 years of experimental studies in this field. The LHCb, with its unique capability to cover the large heavy-quark production cross-section at the LHC, offers an great window of opportunity to explore heavy hadron spectroscopy, in both the conventional and exotic sectors.

This presentation is a synopsis of our work in search of QCD exotica in new decay modes of B-mesons in order to improve the previous measurements and make new observations of these incredible anomalies. I will present current results regarding higher charmonium states which are not fully understood and the possibility of observation of such states in previously un-measured decay modes of B meson in the LHCb data, collected from Run 1 (2011-2012) and Run 2 (2015-2018) in proton-proton (p-p) collisions.

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