

Exotic states of fully heavy hadrons

Wednesday, June 7, 2023 2:30 PM (30 minutes)

QCD supports the existence of hadrons with a structure richer than quark-antiquark mesons and three-quark baryons that are conventionally referred to as exotic. Many candidates for such states have been discovered experimentally in the spectrum of heavy quarks, with their minimal quark content being four-quark: two heavy plus two light quarks. In addition, recent results of the LHCb Collaboration on the double- J/ψ production near the threshold hint at the existence of fully-charmed tetraquark states. In my talk, I will discuss a coupled-channel analysis of the LHCb data and a possible theoretical interpretation of the near-threshold exotic state predicted by this analysis. In the hadronic molecule interpretation, the strength of the interaction in the double- J/ψ system mediated by soft-gluon exchanges is proportional to the chromopolarisability of the J/ψ . The same low-energy parameter evaluated for a fully-heavy baryon appears several times larger than that for the heavy quarkonium composed of the heavy quarks of the same flavour. Thus the LHCb result may signal a possible existence of di-baryon molecules formed by fully heavy baryons.

The talk is based on:

Phys.Rev.Lett. 126 (2021) 13, 132001

Sci.Bull. 66 (2021) 24, 2462-2470

Eur.Phys.J.C 81 (2021) 8, 692

Phys.Rev.D 107 (2023) 3, 03402

Primary author: Dr NEFEDIEV, Alexey (Institute Josef Stefan)

Presenter: Dr NEFEDIEV, Alexey (Institute Josef Stefan)

Session Classification: Exotic hadrons and candidates

Track Classification: Exotic hadrons and candidates