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Hidden-charm pentaquarks in the molecular picture: effective field theory and phenomenological considerations

During the last few years the LHCb collaboration has detected a series of hidden-charm pentaquarks, the most recent one being the $P^{\Lambda}_{\psi s}(4338)$, which has the quantum numbers of a Λ baryon. Most of these pentaquarks are close to a meson-baryon threshold and have been readily interpreted as bound (or molecular) states. Here we explore what are the consequences of the molecular hypothesis, particularly when constrained by heavy-quark spin symmetry [1,2,3,4]. We argue, for instance, that if the $P^{\Lambda}_{\psi s}(4338)$ is to be interpreted as a $\bar{D}\Xi_c$ bound state, this will imply the existence of a $\bar{D}_s\Lambda_c$ partner state with a mass close to 4250 MeV [5]. Finally, we confront predictions coming from effective field theory with phenomenological models, to find what are the converging points between these two approaches.

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Primary author: PAVON VALDERRAMA, Manuel (Beihang University)

Presenter: PAVON VALDERRAMA, Manuel (Beihang University)

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