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The $\Omega_c(3120)$ as a molecular state and its analogy with the $\Omega(2012)$

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We study the $\Omega_c(3120)$, one of the five Ω_c states observed by the LHCb collaboration, which is well reproduced as a molecular state from the $\Xi_c^*\bar{K}$ and $\Omega_c^*\eta$ channels mostly. The state with $J^P = 3/2^-$ decays to $\Xi_c\bar{K}$ in the D-wave and we include this decay channel in our approach, as well as the effect of the Ξ_c^* width [1]. With all these ingredients, we determine the fraction of the $\Omega_c(3120)$ width that goes into $\Xi_c\pi\bar{K}$, which could be a measure of the $\Xi_c^*\bar{K}$ molecular component, but due to a relatively big binding, compared to its analogous $\Omega(2012)$ state [2,3], we find only a small fraction of about 3\%, which makes this measurement difficult with present statistics. As an alternative, we evaluate the scattering length and effective range of the $\Xi_c^*\bar{K}$ and $\Omega_c^*\eta$ channels which together with the binding and width of the $\Omega_c(3120)$ state, could give us an answer to the issue of the compositeness of this state when these magnitudes are determined experimentally, something feasible nowadays, for instance, measuring correlation functions. I will give a presentation based on Ref. [1].

[1] N. Ikeno, W. H. Liang and E. Oset, arXiv:2312.13732 [hep-ph], accepted by PRD.
[2] R. Pavao and E. Oset, Eur. Phys. J. C 78, 857 (2018).
[3] N. Ikeno, G. Toledo, and E. Oset, Phys. Rev. D 101, 094016 (2020).

session

C. Hadron Structure

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