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How many vector charmonium(-like) states sit in the energy range from 4.2 to 4.35 GeV?

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In recent years, many vector charmonium(-like) states were reported by different electron-positron collider experiments above 4.2 GeV. However, so far, there not only exists sizable tension in the parameters of those states, but there is also no consensus on the number of the vector states in this energy range.
In this talk, we focus on the mass range between 4.2 and 4.35 GeV, conducting a comprehensive analysis of eight different final states in e +e − annihilation. Our findings demonstrate that, within this mass range, a single vector charmonium-like state, exhibiting properties consistent with a D1D molecular structure, can effectively describe all the collected data. This is made possible by allowing for an interference with the well-established vector chamonium $\psi(4160)$ along with the inclusion of the D1D threshold effect.

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