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Charmonium-like states with $J^P = 1^+$ and isospin 1

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We present an investigation of the spectrum of exotic charmonium-like mesons using lattice QCD. The focus is on $\bar{c}c\bar{q}q$ $J^{PC} = 1^{+\pm}$ states with isospin 1. Many mesons with properties incompatible with a $\bar{c}c$ structure have already been discovered, e. g. the Z_c mesons with isospin 1. A lattice study of a four-quark system with two different total momenta and on two different lattice sizes is made. We extract the energy levels, use Lüscher's formalism, and determine the scattering length for the $D\bar{D}^*$ scattering close to the threshold. A comparison to results from the phenomenological approaches is made, and the constraints on the scattering length are given.

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