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Scalar and tensor charmonium resonances from lattice QCD

Monday, 16 October 2023 16:20 (30 minutes)

I will discuss scalar and tensor charmonium resonances determined using lattice QCD. Working at $m_\pi \approx 391$ MeV, more than 200 finite-volume energy levels are computed and these are used in extensions of the Lüscher formalism to determine infinite volume scattering amplitudes. Working in the approximation where charm-annihilation is forbidden, the ground state $\chi_{c0}(1P)$ and $\chi_{c2}(1P)$ states are stable. Below 4100 MeV we find a single χ_{c0} and a single χ_{c2} resonance, both strongly-coupled to several decay channels consisting of pairs of open-charm mesons. Both resonances are found on the closest unphysical sheet just below 4000 MeV with a widths of $\approx$ 60 MeV. The largest couplings are to the closed $D^*\bar{D}^*$ channels in S-wave, but several open-charm channels are also found to be large and significant in both cases.

Parallel Session

Hadron Spectroscopy

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Session Classification: Hadron spectroscopy