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Charmonium-like resonances in coupled $D\bar{D}$ - $D_s\bar{D}_s$ scattering

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The first lattice study of coupled-channel $D\bar{D}$ and $D_s\bar{D}_s$ scattering is presented. The partial waves $l = 0, 2$ are investigated on CLS ensembles. The resulting scattering matrix suggests the existence of three charmonium-like states with $J^{PC} = 0^{++}$ in addition to $\chi_{c0}(1P)$: a $D\bar{D}$ bound state just below threshold, a broader resonance likely related to $\chi_{c0}(3860)$ and a narrow resonance just below $D_s\bar{D}_s$ with a large coupling to this threshold. The partial wave $l = 2$ features a $J^{PC} = 2^{++}$ resonance likely related to $\chi_{c2}(3930)$. We work with several assumptions, such as the omission of $J/\psi\omega$, $\eta_c\eta$ and three-particle channels.

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