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## Relativistic three-body scattering and the $D^0 D^{*+} - D^+ D^{*0}$ system

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Scattering amplitudes involving three-particle scattering processes are investigated within the isobar approximation which respects constraints from two- and three-body unitarity. The particular system considered is the  $D^0 D^{*+} - D^+ D^{*0}$ , where the  $D^{*+}(D^{*0})$  enters as a  $p$ -wave  $D^+ \pi^0$  or  $D^0 \pi^+(D^0 \pi^0$  or  $D^+ \pi^-)$  resonance. The interaction potentials in the coupled-channel  $D^0 D^{*+} - D^+ D^{*0}$  system contain the  $\sigma$ ,  $\rho$ ,  $\omega$  and  $\pi$ -exchange. The analytic continuation of the amplitudes across the three-body unitary cuts is investigated to search for poles on the unphysical Riemann sheets. Associated with an unstable particle  $D^{*+}(D^{*0})$  is a complex two-body unitarity cut, through which one can further analytically continue into another unphysical Riemann sheet. Dynamical singularities emerged from the  $\pi$ -exchange potential are stressed. The pole generated from the  $D^0 D^{*+} - D^+ D^{*0}$  interaction and its line shape in  $D^0 D^0 \pi^+$  break-up production are in agreement with double-charmed tetraquark  $T_{cc}^+$  observed by the LHCb Collaboration.

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