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T_{cc} via plane wave approach and including diquark-antidiquark operators

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The analysis of DD^* scattering, where the exotic state T_{cc} was discovered in 2021, in lattice QCD is complicated by long-range interactions, which make the extraction of the scattering amplitude via the Lüscher method dubious. We tackle this problem with a multifaceted approach: first, in addition to the relevant scattering operators, we incorporate a diquark-antidiquark interpolator in order to get the full picture of the energy spectrum. The inclusion of the latter has some impact at physical charm quark mass, although it is more significant for larger heavy quark masses, in line with expectations. Second, we adopt the plane-wave and effective-field-theoretic methods to address the left-hand cut problem and partial wave mixing.

Primary authors: VUJMILOVIĆ, Ivan (Jožef Stefan Institute); PRELOVSEK, Sasa (University of Ljubljana); Dr ORTIZ PACHECO, Emmanuel (Michigan State University); Dr LESKOVEC, Luka (University of Ljubljana); MADANAGOPALAN, Padmanath (The Institute of mathematical Sciences, Chennai); COLLINS, Sara (University of Regensburg)

Presenter: VUJMILOVIĆ, Ivan (Jožef Stefan Institute)

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