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Importance of local tetraquark operators for the $T_{cc}(3875)^+$ spectrum

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The doubly charmed tetraquark $T_{cc}(3875)^+$ observed at LHCb has attracted considerable interest in recent years. To accurately determine its finite-volume spectrum, a variational analysis using a large basis of operators, including bilocal scattering operators but also local tetraquark operators, should be used. Using Wilson-clover fermions at the $SU(3)$-flavour-symmetric point, we investigated the importance of local tetraquark operators for the T_{cc} spectrum by adding them to a large basis of bilocal DD^* and D^*D^* scattering operators. We performed this calculation using the distillation framework combined with a position-space sampling method \[arXiv:2412.09246\]. Upon including the local tetraquark operators, we observe a relatively small shift in the ground state energy, whereas the first excited state shifts significantly. Finally, I will show the effect on the s-wave scattering phase shift obtained from a Lüscher analysis.

Parallel Session (for talks only)

Hadronic and nuclear spectrum and interactions

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