Contribution ID: **270** Type: **Talk**

Lattice Calculation of Proton-Proton Fusion Matrix Element

Wednesday, 31 July 2024 12:35 (20 minutes)

We determined the proton-proton fusion matrix element and constrained the corresponding low energy constant L_{1,A} in the pionless EFT at a pion mass of 432 MeV. To control the systematics, we employed both bilocal and hexaquark interpolation operators. Given that the two-nucleon system at unphysical pion mass is likely to be a shallow bound state or scattering state, the finite volume effects are not negligible. We estimated its finite volume correction by using the two-nucleon spectrum obtained from our lattice data.

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Session Classification: Hadronic and nuclear spectrum and interactions

Track Classification: Hadronic and Nuclear Spectrum and Interactions