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Lattice Calculation of Proton-Proton Fusion Matrix Element

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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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