

Uncertainty Quantification of Hypertriton Binding Energy

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We use the Hypernuclear No-Core Shell Model to study the sensitivity of the hypertriton binding energy to uncertainties in the nucleon-nucleon interaction. Our three-body calculations are performed in the relative Jacobi-coordinate harmonic oscillator basis. In our calculation, we use the leading-order chiral hyperon nucleon(YN) interaction and chiral next-to-next-to-leading-order nucleon-nucleon interactions(NNLOsim). We predict the hypertriton binding energy using this family of 42 NNLO potentials. We find that systematic uncertainties is small for $E(^3\text{H})$. Experimental binding energy is also within our theoretical predictions. Based on our finding of small sensitivity of hypertriton binding energy to NN interaction uncertainties, we claim that it opens up the opportunity to use this bound state observable to constrain the YN interaction.

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