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Theoretical description of proton-deuteron interactions (online)

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Strong interactions between particles are fundamental to understanding the properties of matter. One way to study these interactions is through femtoscopic correlation measurements of particle pairs, extracting information using available theoretical models. In this work, we examine two approaches for describing proton-deuteron (p - d) correlations: the Lednicky-Luboshyts formalism and full numerical solutions of the Schrödinger equation. Our results show that the differences between these methods are significant. Furthermore, we demonstrate that incorporating higher-order partial waves—particularly the p -wave—is essential for accurately capturing the dynamics of p - d interactions and the full potential of the strong force.

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