

Abstract Submitted
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Momentum Space Faddeev Calculation of $d + \alpha$ Scattering¹ JIN LEI, Ohio Univ, LINDA HLOPHE, Michigan State Univ, CHARLOTTE ELSTER, Ohio Univ, ANDREAS NOGGA, FZ Juelich, FILOMENA NUNES, Michigan State Univ — The (d,p) reaction constitutes an important tool for extracting nuclear structure information and contributes to the understanding of the dynamics of reactions. For the three body system $n + p + A$, it is advantageous to treat the problem within a Faddeev framework. Here we present phase shifts and angular distributions for $d + \alpha$ elastic scattering below and above the three-body breakup threshold and reaction cross sections up to 30 MeV deuteron kinetic energy and benchmark with calculations in the literature. We will also study the very low energy behavior below the three-body breakup threshold. The interactions in the subsystems are given by multi-rank separable representations based on the Ernst-Shakin-Thaler scheme of the CD-Bonn interaction for the np system and Woods-Saxon forms for the neutron(proton)- α potential, which already are successfully applied in calculating the ground state of ${}^6\text{Li}$ ². For the initial work the Coulomb interaction is omitted. However, we note that for taking Coulomb into account without screening, separable interaction must be used in the subsystems. Thus, a careful benchmarking of our approach for scattering is warranted.

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²L. Hlophe, Jin Lei, Ch. Elster, A. Nogga, F.M. Nunes, Phys. Rev. **C96**, 064003 (2017)

Charlotte Elster
Ohio Univ

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