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^{6}Li and $d + \alpha$ scattering in a three-body momentum space Faddeev model (I)[1] LEI JIN, INPP and Dept. of Physics and Astronomy, Ohio Univ, LINDA HLOPHE, NSCL, Michigan State Univ, CHARLOTTE ELSTER, INPP and Dept. of Physics and Astronomy, Ohio Univ, ANDREAS NOGGA, INPP and Dept. of Physics and Astronomy, Ohio Univ and FZJ, Jülich, GER, FILOMENA M. NUNES, NSCL, Michigan State Univ and Dept. of Physics Astronomy, Michigan State Univ — The (d, p) transfer reaction constitutes an important tool for extracting nuclear structure information such as spectroscopic factors and asymptotic normalization coefficients. In order to treat the dynamics in all reaction channels on the same footing, it is advantageous to view the (d, p) reaction as a three-body problem $(n+p+A)$ within a Faddeev framework. Coulomb poses severe difficulties when studying these reactions on heavy nuclei with momentum space Faddeev equations. One way to address the challenges is to formulate the problem without screening and using separable interactions. An important first step in testing this formulation is to consider the ground state of ^{6}Li, since this system has been studied in detail before within a three-body $n + p + \alpha$ ansatz. For the np interaction, we employ e.g. the CD-Bonn potential, and for $n + \alpha$ and $p + \alpha$ interactions Wood-Saxon type potentials. We introduce a projection method for the Pauli forbidden state which acts only in the relevant subsystem and thus leaves the structure of the Faddeev equations unaltered. Results for the energy and structure of the ^{6}Li ground state will be presented for both the separable and non-separable approaches. Our results demonstrate the accuracy of the separable approach.

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