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Sub Coulomb barrier d+^{208}Pb scattering in the time-dependent basis function approach[1] PENG YIN, WEIJIE DU, Department of Physics and Astronomy, Iowa State University, XINGBO ZHAO, WEI ZUO, Institute of Modern Physics, Chinese Academy of Sciences, JAMES P. VARY, Department of Physics and Astronomy, Iowa State University — We develop and apply a non-perturbative time-dependent basis function (tBF) approach for low-energy nuclear reactions. We successfully reproduce the experimental ratios of elastic cross sections for d+^{208}Pb scattering at $E_d = 3-7$ MeV employing the tBF method without an explicit optical potential. In this tBF application, we consider all possible electric dipole (E1) transitions among deuteron ground and breakup states that are induced by the Coulomb field of ^{208}Pb. We obtain the deuteron ground and breakup states, which form the basis representation of the tBF method, by diagonalizing a realistic Hamiltonian in a suitably large harmonic oscillator basis. We also investigate the scattering dynamics, the role of the polarization potential and the sensitivity to microscopic inputs such as the deuteron dipole polarizability.

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