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Four-body CDCC analysis of ^{6}He+^{209}Bi scattering near Coulomb barrier energies TOMOAKI EGAMI, KAZUYUKI OGATA, TAKUMA MATSUMOTO, RIKEN, EMIKO HIYAMA, Department of Physics, Nara Womens University, YASUNORI ISERI, Department of Physics, Chiba-Keizai College, MASAYASU KAMIMURA, MASANOBU YAHIRO, Department of Physics, Kyushu University — In 2003, Keeley et al. analyzed the elastic scattering of ^{6}He on ^{209}Bi target at 19.0MeV and 22.5MeV by the continuum-discretized coupled-channels method (CDCC). In the analysis the ^2n+^{4}He+^{209}Bi three-body model, where ^2n denotes dineutron, was adopted. This three-body CDCC analysis, however, failed to reproduce the experimental data of the elastic cross section of ^{6}He+^{209}Bi. In the present paper, ^{6}He+^{209}Bi system is described by n+n+^{4}He+^{209}Bi four-body model and the four-body CDCC analysis, including nuclear- and Coulomb-breakup channels explicitly, is carried out. The three-body (n+n+^{4}He) continuum states of ^{6}He are discretized by the pseudostate method, i.e., pseudostates obtained by diagonalizing the internal Hamiltonian of ^{6}He with Gaussian basis functions are assumed to be discretized-continuum states of ^{6}He. We show that the four-body CDCC well reproduces the angular distribution of elastic scattering data and the total reaction cross section at the both incident energies.

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