Four-body CDCC analysis of $^6\text{He}+^{209}\text{Bi}$ scattering near Coulomb barrier energies

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In the present paper, $^6\text{He}+^{209}\text{Bi}$ system is described by $n+n+^4\text{He}+^{209}\text{Bi}$ four-body model and the four-body CDCC analysis, including nuclear- and Coulomb-breakup channels explicitly, is carried out. The three-body ($n+n+^4\text{He}$) continuum states of $^6\text{He}$ are discretized by the pseudostate method, i.e., pseudostates obtained by diagonalizing the internal Hamiltonian of $^6\text{He}$ with Gaussian basis functions are assumed to be discretized-continuum states of $^6\text{He}$. 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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