Coulomb distorted T-matrix Elements in Momentum Space


Transfer \((d,p)\) reactions are an important tool to study nuclear structure. These can be connected with neutron capture, a topic of great relevance to astrophysics, as well as other applications. Usually, this problem is reduced to a three-body \(n+p+A\). The most advanced Faddeev-type calculations of this kind use the screened Coulomb interaction, which is inadequate for heavy systems [1]. In [2], the Faddeev-AGS formalism is developed in the Coulomb basis, without the need to introduce screening. This Coulomb basis requires the half-shell T-matrix elements (nuclear form factor) folded with the Coulomb wavefunction \(\psi_{q,l}^C(p)\). Handling the \(\psi_{q,l}^C(p)\) and the computation of the integral, require care. The integral regularization technique was presented in [2]. We generalize that regularization procedure for complex form factors. The resulting form factors will be presented and discussed [3]. [1] PRC 84, 034607 (2011). [2] PRC 86, 034001 (2012). [3] PRC in press.

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