

## **Theory of surrogate nuclear and atomic reactions with three charged particles in the final state proceeding through a resonance in the intermediate subsystem**

A.M. Mukhamedzhanov and A.S. Kadyrov

Within a few-body formalism, we develop a general theory of surrogate nuclear and atomic reactions with the excitation of a resonance in the intermediate binary subsystem leading to three charged particles in the final state. The Coulomb interactions between the spectator and the resonance in the intermediate state and between the three particles in the final state are taken into account. Final-state three-body Coulomb multiple-scattering effects are accounted for using the formalism of the three-body Coulomb asymptotic states based on the work published by one of us (A.M.M.) under the guidance of L. D. Faddeev. An expression is derived for the triply differential cross section. It can be used for investigation of the Coulomb effects on the resonance line shape as well as the energy dependence of the cross section. We found that simultaneous inclusion of the Coulomb effects in the intermediate and final state decreases the effect of the final-state Coulomb interactions on the triply differential cross section [1].

[1] A.M. Mukhamedzhanov and A.S. Kadyrov, *Few-Body Systems* **60**, 9 (2019).