

Microscopic optical potentials including the breakup effects for unstable nucleus scattering

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Recently, study on unstable nuclei near the neutron dripline has been attracted by the development of radioactive ion-beam experiments. The optical potential between a projectile and a target is a basic ingredient to describe the elastic scattering. In the neutron-rich region, it is difficult to determine the phenomenological optical potential due to restrictions on experimental data. Therefore, we need to construct the optical potential microscopically.

The g-matrix folding model has been widely used as a reliable method to obtain the microscopic optical potential. However, this approach does not work well for the case of unstable nuclei, since the folding model neglects projectile-excitation effects that are important for reactions involving weakly-binding nuclei.

In our study, we propose a method to construct a microscopic optical potential including projectile-excitation effects by combining the folding model with the Glauber model. In this conference, we will report the results applied to ${}^3\text{He}$ scattering, and discuss applicability to the case of the proton target.

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