

Theoretical Nuclear Reaction Database based on Microscopic Calculations

(S. Ebata, 2017-05-19)

We are constructing a theoretical database of the elastic scattering and reaction cross sections for nuclear chart. The database covers about 3,500 nuclide for $A=12 - 276$ with $Z=6 - 92$ including odd-mass nuclei induced by proton, neutron and alpha. Because the database is constructed with the microscopic calculations which cannot be modified arbitrary, it will contribute to confirm the experimental data compiled in EXFOR.

The database will provide useful data not only for the nuclear physics but also nuclear application fields. Furthermore, this construction is an important step to connect easily among the microscopic studies and application fields.

To construct the database, we employ the microscopic models: three-dimensional Skyrme-Hartree-Fock+Bardeen-Cooper-Schrieffer model for the ground states, and Folding model with DDM3Y interaction and Glauber model for the low- and high-energy reaction calculations, respectively, which are well used in the nuclear physics.

We will report the theoretical methods and the progress of the database.