

RIBF ULIC Symposium/mini-WS Report

* English only

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Summary of discussions and its (expected) results:

In this mini WS, latest results on the microscopic description of nucleus-nucleus (A-A) scattering were reported by Dr. Minomo (RCNP, Osaka) and Dr. Furumoto (Ichinoseki). One of the main topics is the so-called three-body force (3NF) effect to be observed in A-A elastic scattering and/or other nuclear processes. Both groups reported the 3NF effects would be observed in the angular distribution of A-A elastic scattering in high momentum transfer regions, e.g., ^{16}O - ^{16}O scattering at 70 MeV/nucleon; inclusion of the 3NF contribution was shown to be necessary to explain the experimental data. The role of the 3NF in the A-A one-body potential is, however, quite different in each model. In the framework of the chiral effective field theory, 3NF makes the real part (V) slightly shallower and the imaginary part (W) considerably deeper, while the multi pomeron exchange (MP) model suggests that the 3NF makes V quite shallower. Both changes cause the reduction of the A-A elastic scattering cross section at backward angles, resulting in good agreement with experimental data. Intensive discussion on how to discriminate the two models was done. One possibility is to measure A-A scattering at several energies, say, 200-400 MeV/nucleon. The MP model predicts a change in the oscillation pattern of the cross section at around 400 MeV/nucleon. Experimental verification of this prediction will be very important. Another possibility is to use nucleon knockout reactions, through which one may discriminate the nucleon-nucleon effective interactions with 3NF at around the nuclear saturation density.

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