Elastic alpha scattering experiments at astrophysically relevant energies in the $A \approx 100$ mass region

G. G. Kiss$^a$

$^a$ Institute of Nuclear Research of the Hungarian Academy of Sciences (ATOMKI), Debrecen, Hungary
E-Mail: ggkiss@atomki.hu

In nuclear astrophysics the importance of particle capture and emission reactions involving alpha particles makes it necessary to determine the form of the alpha-nucleus potentials in the astrophysically relevant energy region in order to give correct predictions for the cross sections and reaction rates by the statistical model. Considerable experimental and theoretical efforts have been devoted to improve the knowledge of the alpha-nucleus optical potential at energies close to the Coulomb barrier [1-4].

In recent years, elastic scattering experiments have been performed on several isotopes at ATOMKI, Debrecen [1 (and references therein)] and the results have been compared with model predictions using global optical potential parameter sets. Reasonable agreement was found in some cases. However, a global alpha nucleus optical potential must be able not only to reproduce the measured angular distributions, but also the behavior along an isotopic chain. As a continuation of these studies we investigated the ratio of angular distributions along several isotonic and isotopic chains to test the global models. Here we would like to present the experimental details, results and compare the measured angular distributions with several model predictions.

References