Contribution ID: **170** Type: **Oral**

Modeling nuclear reactions of light nuclei: transition between microscopy and phenomenology

Tuesday, 1 September 2015 14:00 (15 minutes)

In general standard reaction theory combined with proper nuclear and Coulomb interactions lead to fair description of nuclear reaction cross sections. The situation is less satisfying for reactions in the resonance regime because there is no proper method available to determine the positions and widths of resonances. Hence the resonance region is usually described via R-matrix theory which provides an excellent description of cross sections if the positions and widths of the resonances are known. At present the transition to the region with a continuous level density at higher energies is intriguing. This is particularly disturbing for the nuclear data evaluation of light nuclei. In the present contribution we propose a method which guarantees the continuous transition between resonance regime and standard reaction calculations based on the statistical model as well as on coupled-channel calculations. In order to find a proper method the R-matrix technique is well suited. On the one hand it provides an excellent phenomenological description of the resonance region. On the other hand it represents a method for the solution of coupled-channel equations. Combining both aspects of the R-matrix theory offers a promising route towards the goal of a continuous transition. Work partly supported by EC project ENSAR, F4E-FPA168.02 and ÖAW Matching Grant MG 2014-4.

Primary author: SRDINKO, Thomas (TU Wien, Atominstitut)

Co-author: Prof. LEEB, Helmut (TU Wien, Atominstitut)

Presenter: SRDINKO, Thomas (TU Wien, Atominstitut)

Session Classification: Nuclear Structure, Spectroscopy, and Dynamics III