NICE- Neutron Induced Charged particle Emission

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Neutron-induced nuclear reactions with the charged particle in the exit channel play an essential role in the s-process nucleosynthesis, but are also important for medical and nuclear reactor technologies. Despite this importance, cross-section data for such reactions are still scarce because of the short range of charged particles (μm), which hampers their detection. Only very thin samples in the range of micrometers can therefore be used. New approaches are required in particular for the time-of-flight technique to overcome the low reaction rates.

A new detector setup (NICE-detector) based on an organic plastic scintillator was proposed and tested at the Goethe University Frankfurt. One of the test cases was the capture cross-section of ^{209}Bi at different astrophysically important energies. In this talk, the performance of the adapted detector setup as well as the results of calculated cross-section values will be presented. This project is supported by the DFG project NICE (RE 3461/3-1).