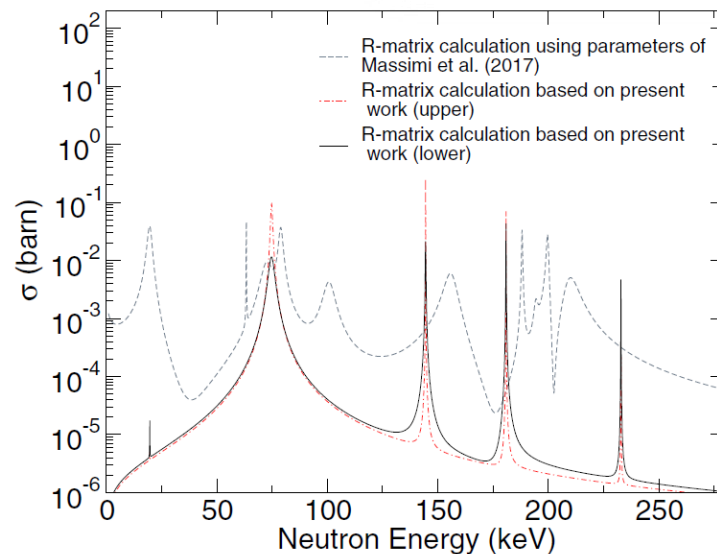
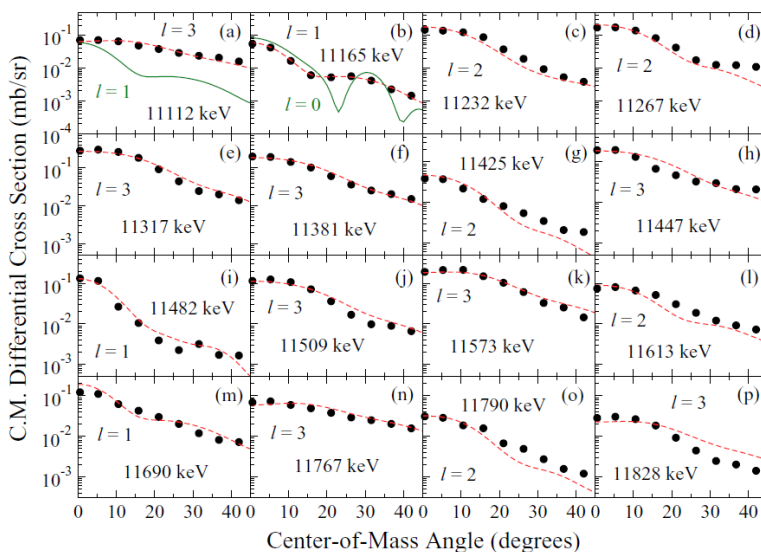


Neutron transfer studies on ^{25}Mg and its correlation to neutron radiative capture processes



Radiative neutron capture reactions play an important role in nuclear astrophysics, but it is often the case that the reaction rates need to be known for interactions on unstable nuclei. Since these reactions are often impossible to measure directly, neutron transfer reactions have been used as a surrogate approach. We have investigated the reliability of this approach by comparing measurements on stable nuclei.



We have made new experimental measurements of the $^{25}\text{Mg}(d,p)^{26}\text{Mg}$ reaction, in order to investigate the reliability of this method against well known $^{25}\text{Mg}(n,\gamma)^{26}\text{Mg}$ measurements. With the aid of R-matrix calculations, we show that the levels populated in the transfer reaction are substantially different from the measured $^{25}\text{Mg}(n,\gamma)^{26}\text{Mg}$ cross sections. This result demonstrates that neutron transfer reactions may not necessarily lead to reliable predictions for neutron capture rates.

