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# Inverse-Oslo studies at iThemba LABS

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Reactions induced by beams of light ions such as protons, deuterons, $^{3}$He and  particles have been the main tool for investigating nuclear properties for almost a century. In recent years such reactions have been used to measure the nuclear level density (NLD) and the -ray strength function (SF) [1]. These quantities have been identified as one of the key quantities in proper description of reaction rates that play an important role in the nucleosynthesis of heavy elements [2] and are vital to understand the enhancements found in the tail of the giant dipole resonance [3].

Unfortunately, the application of the traditional light ion experiments is limited, as it requires targets that are reasonably stable, both in terms of chemistry and radioactivity. This limitation makes it challenging or even impossible to probe the SF and NLD with traditional light ion beam experiments in certain parts of the nuclear chart such as the noble gases, neutron rich nuclei, etc. A possible resolution of this problem is to use inverse kinematics where the beam and target have been interchanged. This was first tested at iThemba LABS in 2015 with a $^{86}$Kr beam and a deuterated-polyethylene target, with the goal of probing the NLD and SF of $^{87}$Kr. This experiment has been followed up by additional explorations of the noble gases in 2017 with experiments with both $^{84}$Kr and $^{132}$Xe beams at iThemba LABS.

Biblography:
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