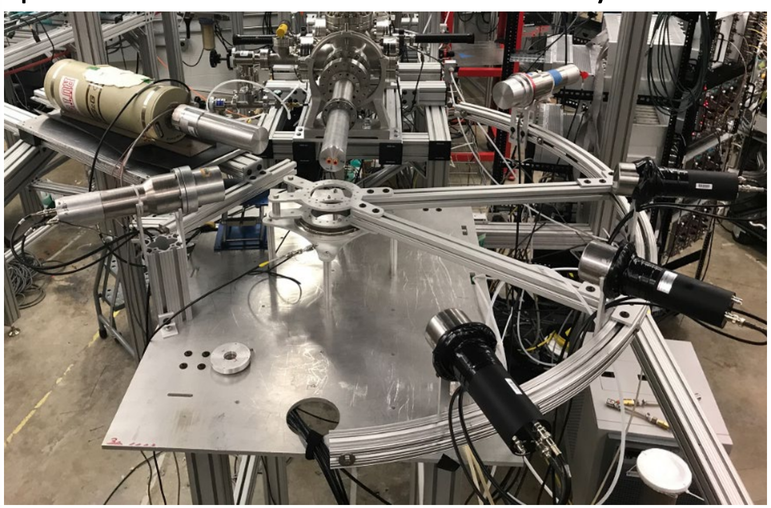
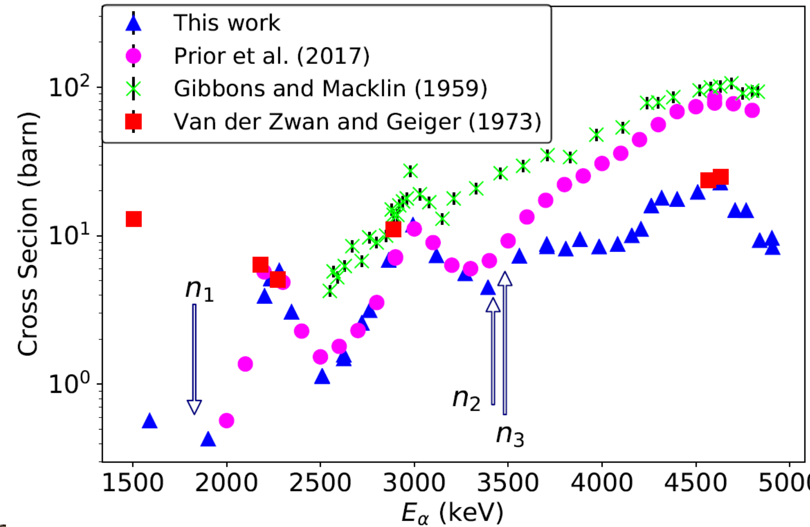
Study of the $^{10}B(a,n_0)^{13}N$ reaction for National Ignition Facility application

The National Ignition facility is capable of creating an environment that it so hot and dense that it mimics the conditions at the heart of a star. However, the energy required is so great that it can only be sustained for a few nano-seconds. This presents a great challenge for measuring reactions under these conditions. One effective method is the activation technique, which creates radioactive products that last for minutes or days.





One such reaction is $^{10}B(\alpha,n)^{13}N$, where the α-particles are generated through the $d(t,n)\alpha$ reaction (so called alpha-boot-strapping). However, the cross section for this reaction has not been well studied. New measurements made at the NSL characterized the $^{10}B(\alpha,n_0)^{13}N$ reaction for the first time over the applicable energy range and resolved inconsistencies with older measurements.

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