



Contribution ID: 1247 Contribution code: TUPM043

Type: **Poster Presentation**

Low energy nuclear cross section measurement facility at Crocker Nuclear Laboratory at the UC Davis

Tuesday, 9 May 2023 16:30 (2 hours)

The vast majority of nuclear physics simulations are dependent on the National Nuclear Database, maintained at Brookhaven National Lab, and these in turn are all based on published experimental measurements. Even today, there are gaps in this database in low energy ranges, which can be filled even by older machines. In addition to the scientific output, these measurements provide a unique educational opportunity. The cyclotron at the Crocker Nuclear Laboratory at UC Davis is capable of accelerating protons, deuterons, or alpha particles to variable energies up to a maximum of 67 MeV for protons. We have developed a facility to perform “stack foil” cross section measurements, in which stacks of target foils sandwiched with degraders are exposed to proton or deuteron beams, thus allowing us to exploit the energy loss through the stack to measure energy dependent cross sections in a single exposure. Daughter nuclei are assayed using a high purity germanium (HPGe) detector.

This poster will describe the facility, including the range of available beam parameters and energy and current calibration, as well as presenting some representative cross section measurements. Future plans will also be discussed.

Funding Agency

This work is supported by US Department of Energy grant MCA 00010836 (Prime DE-NA0003996).

Footnotes

I have read and accept the Privacy Policy Statement

Yes

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Session Classification: Tuesday Poster Session

Track Classification: MC4: Hadron Accelerators: MC4.A13: Cyclotrons