

Status of STARLiTe beamline at Texas A&M Cyclotron Institute

J. T. Burke, R. Casperson, M. McCleskey and the STARLiTe collaboration

The STAR LiTe collaboration consists of more than 55 researchers, post-docs, graduate and undergraduate students from five different countries and multiple national laboratories and universities. Work on the installation of the STARS (Silicon Telescope Array for Reaction Studies) and the LiBerACE (Livermore-Berkeley array for collaborative experiments) [1] at TAMU-CI was completed in March of 2012 and the commissioning run of $^{243}\text{Am}(p,t)^{241}\text{Am}$ for the study of the $^{240}\text{Am}(n,f)$ reaction via the surrogate method was completed in April of 2012 [2]. Since that time an additional 8 experiments have been performed by 6 different groups representing over 1100 hours of beamtime. Analysis of these experiments is ongoing and results are expected to begin to be published in the coming months.

Experiments performed this past year:

- $^{174}\text{Yb}(p,d)^{173}\text{Yb}^*$ to measure benchmark $^{173}\text{Yb}(n,g)$ case for surrogate reaction
- $^{239}\text{Pu}(p,d)^{238}\text{Pu}^*$, $^{239}\text{Pu}(p,t)^{237}\text{Pu}^*$ to measure $^{236,237}\text{Pu}(n,g)$ cross sections using the surrogate technique
- $^{95}\text{Mo}(d,pg)^{96}\text{Mo}^*$, $^{95}\text{Mo}(d,p)^{96}\text{Mo}$ to measure $^{95}\text{Mo}(n,g)$ cross sections using the surrogate technique
- $^{89}\text{Y}(p,d)^{88}\text{Y}^*$, $^{89}\text{Y}(p,t)^{87}\text{Y}$ to measure $^{87}\text{Y}(n,g)$ cross sections using the surrogate technique
- $^{54}\text{Fe}(^{12}\text{C},p)$ for nuclear structure and model testing
- $^{24}\text{Mg}(^4\text{He}, ^4\text{He})^{24}\text{Mg}^*$ as a surrogate for the astrophysical $^{12}\text{C} + ^{12}\text{C}$ reaction
- $^{175}\text{Lu}(p,d)^{174}\text{Lu}^*$ to determine $^{173}\text{Lu}(n,g)$ cross section using the surrogate technique
- $^{152}\text{Sm}(p,d)^{153}\text{Sm}^*$ and $^{154}\text{Sm}(p,d)^{155}\text{Sm}^*$

[1] S.R. Leshner *et al.*, Nucl. Instrum. Methods Phys. Res. **A621**, 286 (2010).

[2] M. McCleskey *et al.*, *Progress in Research*, Cyclotron Institute, Texas A&M University (2011-2012) p. V-58.