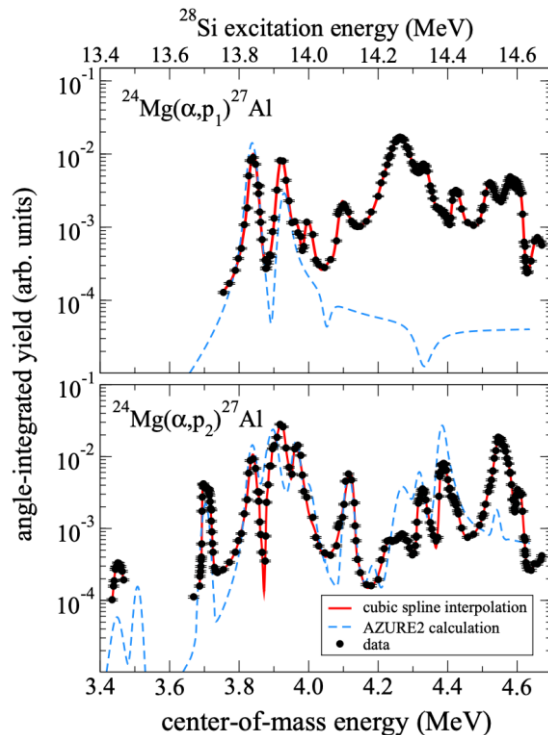


First measurement of the $^{24}\text{Mg}(\alpha, p\gamma)^{27}\text{Al}$ reaction and its impact on x-ray bursts



The $^{24}\text{Mg}(\alpha, p)^{27}\text{Al}$ reaction has been identified as an important reaction that influences the energy generation of x-ray bursts, but the contribution from reactions to the excited states of ^{27}Al have not been previously considered. We have measured the $^{24}\text{Mg}(\alpha, p\gamma)^{27}\text{Al}$ reaction to the first two excited states of ^{27}Al for the first time via the detection of secondary γ rays. The high beam intensity available from the NSL 5U accelerator in conjunction with the high-efficiency LaBr_3 array HAGRID, allowed for the precise measurement of cross sections. We found that the contribution to the $^{24}\text{Mg}(\alpha, p)^{27}\text{Al}$ cross section is small, but may become significant for hot astrophysical scenarios.

