

Abstract Submitted
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Measurement of the ${}^1\text{H}({}^{17}\text{F}, \alpha){}^{14}\text{O}$ cross section at TWIN-SOL JUN HU, DAN BARDAYAN, PATRICK O'MALLEY, JAMES KOLATA, MATTHEW HALL, OSCAR HALL, JACOB ALLEN, University of Notre Dame — The ${}^{14}\text{O}(\alpha, \text{p}){}^{17}\text{F}$ reaction is one of the main probable breakout routes, which lead to the rp-process from the hot-CNO cycle, converting the initial CNO elements into heavier elements. Although many indirect measurements have been done to determine the resonant rates of this reaction, reaction rates can be incorrect by orders of magnitude by utilizing different methods. Furthermore, there is short of directly measured cross section data at the energy of astrophysical interest. The ${}^1\text{H}({}^{17}\text{F}, \alpha){}^{14}\text{O}$ reaction, the time-inverse of the ${}^{14}\text{O}(\alpha, \text{p}){}^{17}\text{F}_{\text{g.s.}}$ reaction, will be studied using a radioactive ${}^{17}\text{F}$ beam at TWINSOL. The (p, α) reaction cross sections will be measured over the energy range of interest for X-ray bursts. Finally, the ${}^{14}\text{O}(\alpha, \text{p}){}^{17}\text{F}_{\text{g.s.}}$ reaction can be determined from detailed balance. This talk will introduce the preparations for the coming experiment.

Jun Hu
University of Notre Dame

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