Hybrid Detector at DRAGON

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DRAGON is a recoil mass separator, which studies the products of radiative capture reactions that occur in a variety of stellar phenomenon. My research involves determining the efficacy of the new Hybrid Ionization Chamber - Double Sided Silicon Strip Detector as a focal plane detector for the recoils from nuclear reactions. Prior to the Hybrid detector, DRAGON could either use a isobutane filled Ionization Chamber (IC) or a Double Sided Silicon Strip Detector (DSSSD) detector. The IC has the advantage of being able to identify isobaric contaminants in the products, whereas the DSSSD lacks this feature but has superior energy resolution. The Hybrid Detector has been designed to exploit the advantages of each detector. In my presentation, I will be comparing the alpha spectrum data obtained form a composite alpha source with Geant4 simulations of the hybrid detector. I will also present preliminary data from a $^{22}\mathrm{Ne}(p,\gamma)$ reaction run performed at DRAGON in the third week of July 2017. We obtained several spectra of the reaction at different energies measured at different chamber pressures, which showcased the separation efficiencies of the detector, while highlighting certain limitations that we have to work on for future runs. I will also be mentioning the astrophysical significance of making precise measurements of nuclear reactions, such as the $^{22}\mathrm{Ne}(p,\gamma)$ reaction.