Stable Ion Beam Experiments with the DRAGON Recoil Separator at TRIUMF

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The DRAGON experiment (Detector of Recoils And Gammas Of Nuclear reactions) was designed to provide a recoil separator to study radiative capture reactions, both on protons and alpha particles, using accelerated radioactive ion beams at the ISAC-I facility of the TRIUMF laboratory in Vancouver, Canada. The addition of a Supernanogam ECR source now allows for the use of stable ion beams with intensities in the 1E12 s-1 range at the beam lines connected to the ISAC-I accelerator. The DRAGON experiment consists of a windowless, recirculating gas target which is surrounded by a BGO scintillator array to capture the gamma photons emitted in the radiative capture reactions on hydrogen or helium gas. The heavy reaction recoils travel with the incident ion beam into the actual recoil separator consisting of consecutive magnetic and electrostatic dipoles. These provide beam suppression factors of order 1E8-1E13 depending on ion type and energy regime. The remaining leaky beam ions and reaction recoils are detected in the focal plane using a local time-of-flight and an energy detection system, which, either independently or together with the BGO array, provide further beam suppression. The sensitivity of the system, coupled with the now available stable heavy ion beam intensities, makes the DRAGON experiment competitive with low energy nuclear physics measurements at other facilities employing more intense proton or alpha beams in normal kinematics. This contribution will present recent results using neon (20-Ne, 21-Ne) and sulphur (34-S) beams for the measurement of radiative capture reactions relevant to nuclear astrophysics.