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Projectile fragmentation studies using F, Ne, and Na isotopes MARIA MAZZA, Gettysburg College, MONA COLLABORATION — Projectile fragmentation is one of the techniques used at nuclear science facilities around the world for the production and study of rare isotopes. In the inverse kinematics reaction, a heavy high energy primary beam impinges on a reaction target producing an excited pre-fragment that soon decays - in a time range between 10^{-9} and 10^{-21} s - by emission of neutrons and gamma rays. The result is a secondary beam of radioactive nuclei suited for each experiment's needs, but the short lifetime of the pre-fragments prevents direct observation. However, an indirect analysis can be conducted from the reaction products. Neutron multiplicities and the excitation energies of the final fragments are in fact related to the pre-fragments produced in the target and this relationship is expected to be enhanced for final fragments with mass number closest to the reacting beam. The experiment was performed at the National Superconducting Cyclotron Laboratory (NSCL), where a ^{32}Mg beam at 86 MeV/u was impinged on a ^{9}Be reaction target. The MoNA Collaboration measured neutron multiplicities and kinetic energy spectra for neutrons in coincidence with sodium, neon, and fluorine final fragments in order to study the reaction mechanisms in the production of specific pre-fragments.

Maria Mazza
Gettysburg College

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