EMIS XVII

The Argonne Gas-filled Fragment Analyzer

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Gas-filled recoil separators are characterized by an unparalleled transmission for products of fusion-evaporation reactions. They also offer a very good primary beam suppression for reactions with relatively light beams impinging on heavy targets. Consequently, gas-filled separators have been playing an essential role in studies of super-heavy nuclei, which are produced with tiny cross sections and require very intense beams.

In order to extend the studies of super-heavy nuclei at ATLAS, the Argonne Gas-Filled Fragment Analyzer (AGFA) was designed and is currently under construction. It consists of a large bore quadrupole followed by a dipole with the combined function of horizontal focusing and bending of ion trajectories. Its unique features include large space in front of the separator sufficient to accommodate a 4π Ge array for in-beam gamma-ray studies and a compact focal plane to achieve a high gamma-ray detection efficiency for decay studies. AGFA will be coupled to GAMMASPHERE for in-beam gamma-ray spectroscopy, including calorimetry, of trans-Fermium nuclei. In the stand-alone mode, it will be used for decay spectroscopy, such as alpha-decay fine structure and K-isomer studies, and for new super-heavy element searches in the future. It can also be coupled with a gas catcher to produce cool beams of super-heavy ions for precision mass measurements and laser spectroscopy.

During the talk, the details of AGFA design and its parameters will be presented and plans for experimental program with AGFA will be discussed.

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