

We are measuring the correlations between fission fragment angular momenta and their properties to understand the dynamics of nuclear scission. The twin Frisch-gridded ionization chamber (TFGIC) we have assembled, loaded with a 200 kBq  $^{252}\text{Cf(sf)}$  target, will be placed at the center of the Gammasphere, an array of 110 high-purity germanium detectors. GS and TFGIC will work in coincidence: TFGIC will provide a collection trigger, the total kinetic energy of the fission reaction, the approximate direction of motion, and the approximate fragment masses; Gammasphere will determine the exact fragment masses, the total yield of gamma rays, and the distribution of discrete levels in the fragment that are populated following fission. We plan to measure the dependencies of the discrete level distribution on fragment properties, such as masses and kinetic energy, to better constrain the angular momentum generation mechanism and thus improve fission models like CGMF and FREYA. We anticipate that these improvements will provide the nonproliferation community with more accurate signatures of fission radiation, aiding in the development of technologies that can identify, characterize, and track special nuclear material in a fast and efficient way.