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**Measurement of the $\alpha$/SF branching ratio of $^{252}$Cf with the NIFFTE fission TPC** LUCAS SNYDER, Lawrence Livermore Natl Lab, NIFFTE COLLABORATION — Neutron-induced fission cross sections are important in the simulation and modeling nuclear fuel cycles. The Neutron Induced Fission Fragment Tracking Experiment (NIFFTE) collaboration is developing a fission Time Projection Chamber (TPC) to measure neutron-induced fission cross sections with total uncertainty of better than 1%. To achieve such precision, the systematic uncertainties of the previously used measurement techniques must be addressed. The fission TPC will do this, in part, by providing detailed 3-dimensional images of fission fragments and other charged-particles produced in a neutron beam environment. Throughout the fission TPC's development phase the $\alpha$-decay and spontaneous fission of $^{252}$Cf has been used to benchmark its performance. Recently the first $^{252}$Cf data were collected using the fully instrumented fission TPC, which has nearly 6000 individual channels and provides $4\pi$ coverage. A preliminary analysis of the $\alpha$/SF branching ratio will be presented.

Lucas Snyder
Lawrence Livermore Natl Lab

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