

# Measuring $(n,f)$ & $(n,z)$ Reactions with the fissionTPC

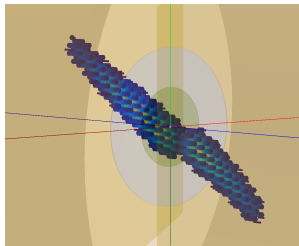
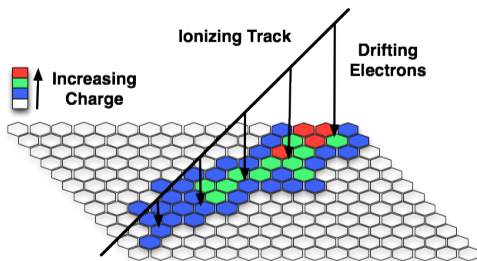
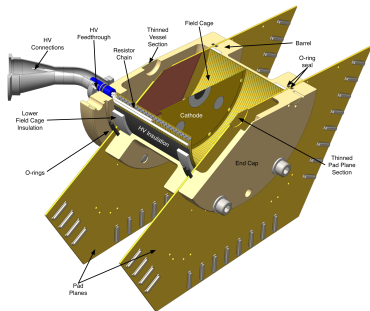
LLNL-PRES-765362

Lucas Snyder

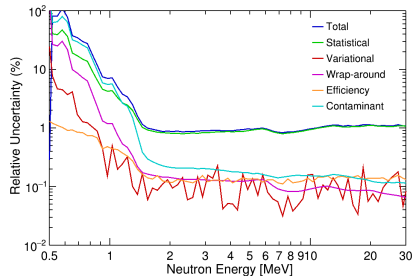
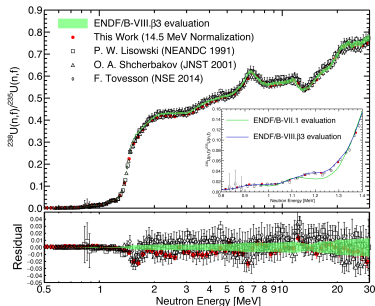
Jan. 24, 2019



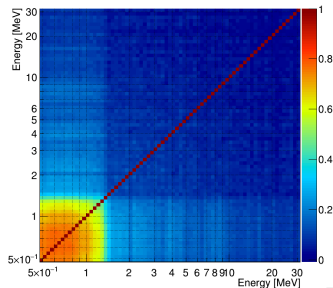
# The fissionTPC



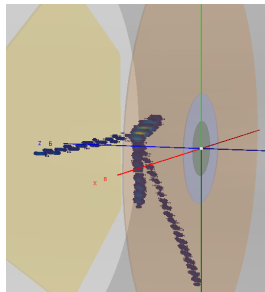
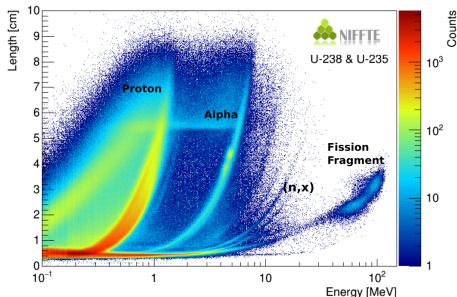
# 3D Reconstruction of Fission Fragment Tracks for Precision Fission Measurements



- $^{238}\text{U}(n,f)/^{235}\text{U}(n,f)$  Cross Section  
Phys Rev C 97, 034618 (2018)
- Precision measurement with complete uncertainty analysis
- Highly detailed entry into EXFOR database



# (n,z) Reactions



- Charged particle tracks from proton to FF are visible
- Particular advantage for multi-particle events.  $^{12}\text{C}(n,3\alpha)$ ,  $^8\text{Be}(n,2\alpha)$ ,  $^6\text{Li}(n,t)\alpha$ , etc.
- Solid and gaseous targets are possible
- Mock evaluation performed by D. Neudecker (LANL) shows that a  $^{239}\text{Pu}(n,f)/^6\text{Li}(n,t)\alpha$  measurement will have a considerable impact on the evaluation of both reactions