

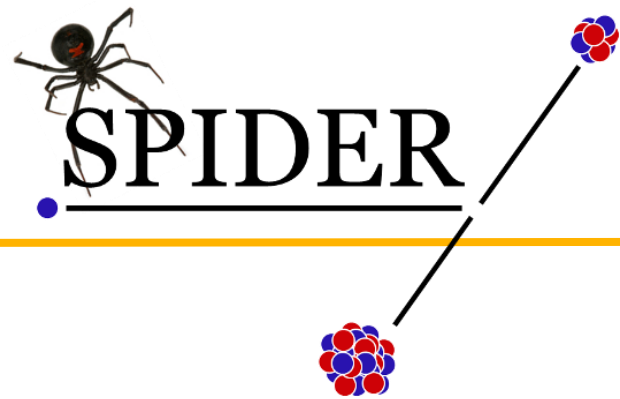
US Experimental FPY Work Has Been Initiated

- **TUNL (North Carolina): Mono-energetic measurements using Ge detectors**
 - Data by 2014
- **SPIDER – LANL measurements using a spectrometer**
 - First data by 2015
- **Nevada Critical Assembly Measurements, providing broad energy sources, using both Ge and radiochemical fission product measurements**
 - First data by 2014 we hope

Triangle University Nuclear Laboratory FPY Measurements from 1.6 to 14 MeV, for $^{235,8}\text{U}$ and ^{239}Pu

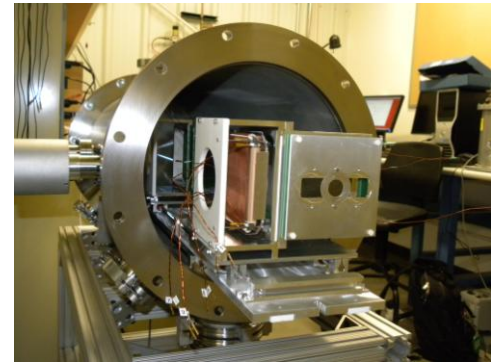
- **Ongoing Program of measurements, by staff from TUNL, LANL, and LLNL**
 - Focus is on key burn FPS: ^{147}Nd , ^{95}Zr , Ce, ^{99}Mo , ^{140}Ba
 - Preliminary data taken and reported at ND2013
- **Goal is to measure energy dependencies of FPY, and eventually, absolute FPYs**
- **Timeline**
 - Preliminary data later this year
 - Final data in 2014?

Fission yield measurements with



■ New instrument for measuring independent fission yields

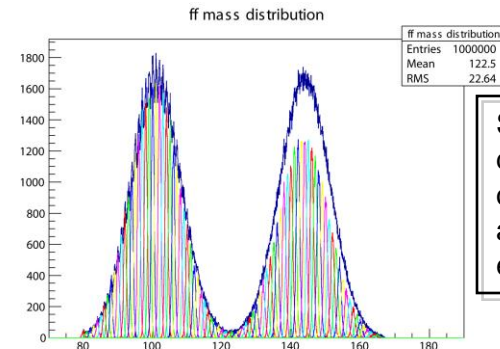
- Fragment time-of-flight (TOF) spectrometer
 - Measures TOF and kinetic energy of both fragments in coincidence
 - Correlates fragment mass, charge and energy
- Target resolution
 - Mass: 1 amu for light fragments, 1.5 amu for heavy
 - Charge: 1 unit charge for light fragments (heavy fragment charge obtained from charge conservation)
 - Energy: 0.5-1.0%
- Experiments at the Los Alamos Neutron Science Center (LANSCE)
 - Incident neutrons ranges from thermal to several hundred MeV (moderated and un-moderated spallation targets)
 - Neutron time-of-flight to measure incident neutron energy



Timing detector assembly for the SPIDER spectrometer

■ Timeline

- Dual-arm spectrometer completed August 2013
- Thermal fission yields for U-235 and Pu-239
 - Beam experiments Sept.-Nov. 2013
 - Preliminary results March 2014
 - Finalized mass yields August 2014
- Fast-neutron induced fission yields for U-235 and Pu-239
 - Complete scaled-up of spectrometer August 2014
 - Beam experiments in 2014 and 2015
 - U-235 mass yields ($E = 1 - 15$ MeV) in 2015
 - Pu-239 mass yields ($E = 1 - 15$ MeV) in 2016



Simulated mass distribution based on currently achieved TOF and energy resolution