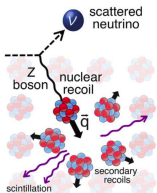
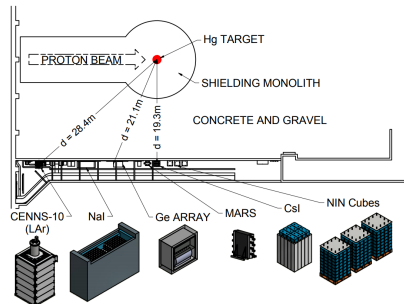
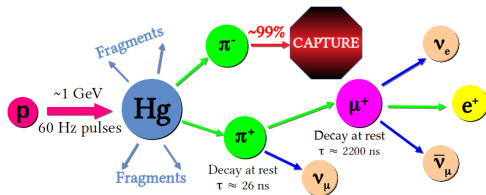


# Neutrino Flux Simulations for COHERENT

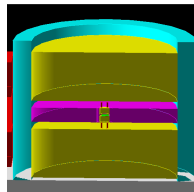
Wednesday #30



The Spallation Neutron Source (SNS) at Oak Ridge National Lab produces pulsed neutrinos in the sub-50 MeV range that are advantageous for coherent elastic neutrino-nucleus scattering (CEvNS) observation.

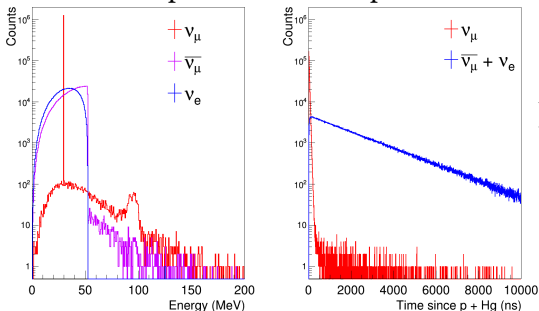


Geant4.10.1 Simulation:



Incident protons  
Hg Target  
Target shielding  
QGSP\_BERT  
“neutrino alley”

## Neutrino spectra for 1 GeV protons



At 20 m from the target,  
with  $8.7 \times 10^{15}$  POT/second:  
 $\Phi_{\nu_\mu + \bar{\nu}_\mu + \nu_e} = 4.3 \times 10^7 \frac{\text{neutrinos}}{\text{cm}^2 \text{s}}.$

Assigned uncertainty: 10%

Possible experimental options:

- D<sub>2</sub>O detector at SNS
- Measure pion production from p + Hg

## Neutrino flux at given proton energy

