LZ20 Update

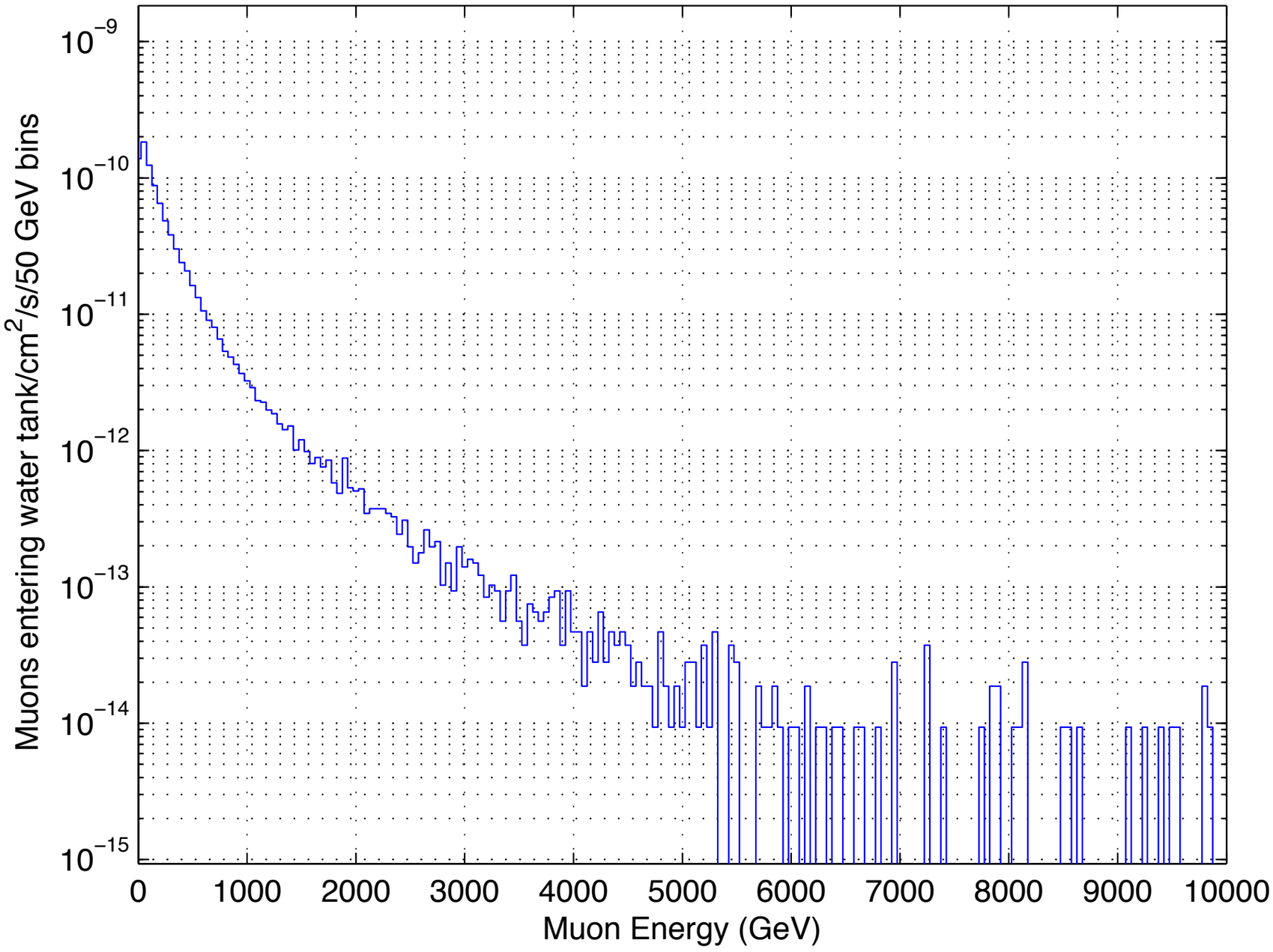
Monica Pangilinan, Dave Malling

May 24, 2012

Simulation Setup

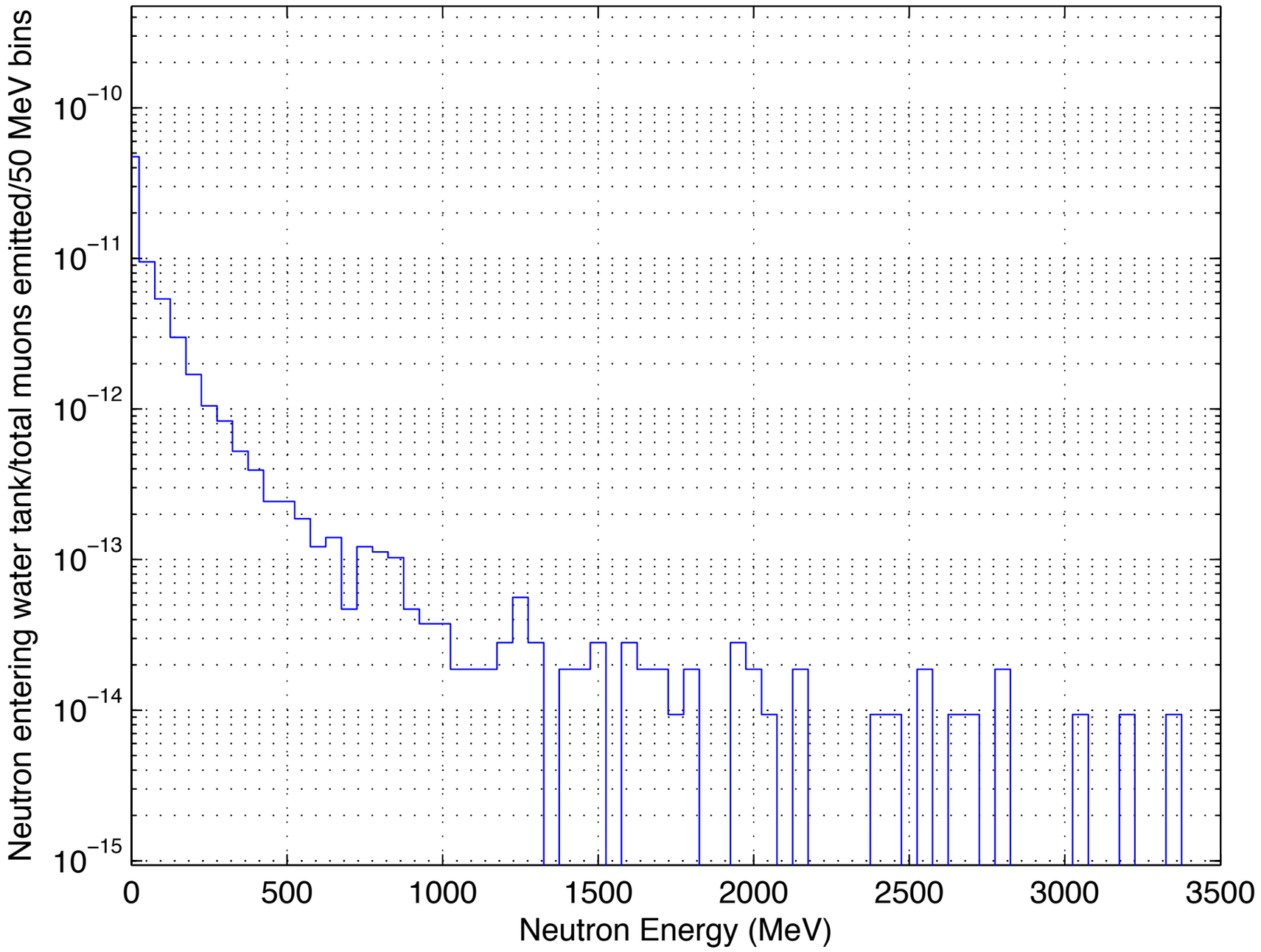
- 690k muon events run and analyzed from muons Chao generated with MUSUN in 34 m x 34 m x 34m rock with 20m x 20m x 20m cavern with LZ20 in the center
- uses Geant4.9.5p01 using LUXSim
- applied E >100 keV for all muons and neutrons in following slides
- normalized to 6.5 x 10^{-9} mu/cm^2/s

Muons entering Water Tank



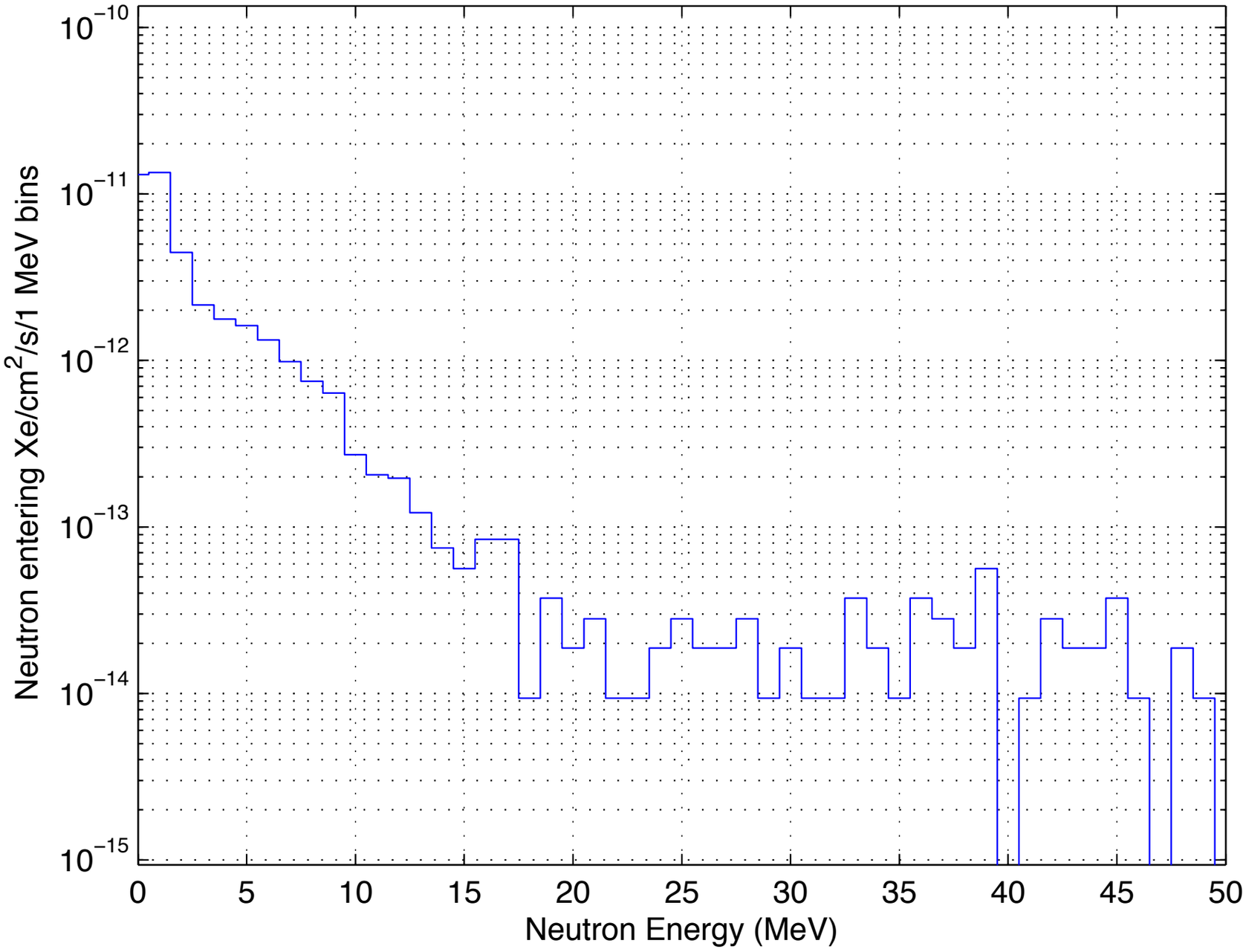
- 14% of muons emitted enter water tank (93922 from 690000)
- For muons that enter water tank, 62% of these coming from the top

Neutrons entering Water Tank



- 7666 neutrons enter water tank from 690k muons emitted -> 1% of all muons emitted
- 28% of these neutrons that enter water tank are coming from the top

Neutrons entering Xenon



- Only focus on low energy neutrons (< 50 MeV) since these neutrons have a higher probability for being a WIMP-like event
- For each muon emitted, 0.6% will produce a low energy neutron that enters the Xe

To do:

- Finish up all 1 million events before running Angie's muons
- Consistency checks:
  - Comparisons with Angie's and Chao's previous results
    - How does it compare with Mei-Hime neutron spectrum
- Update rate table on Wiki