

# Geant4 and FLUKA at Homestake

A. Reisetter

With work from

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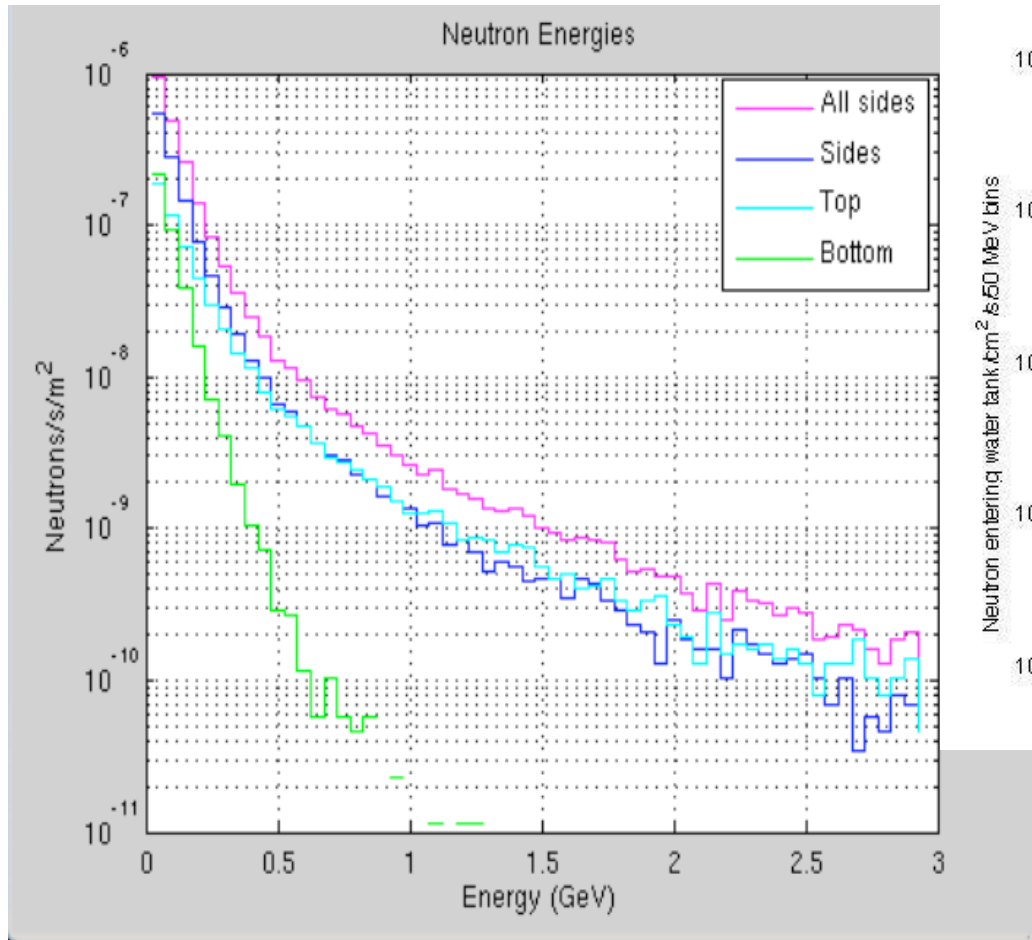
# The Sims

- Geant4: will use average from sims for LXe at Homestake
  - Geant4.9.5.p01 + Shielding physics list fix; Shielding physics and MuonNuclear process on
  - Cavern 20m cube
  - Muons thrown from parallelepiped (5 sides) with 7m rock surrounding cavern
  - Livetime found by setting muon flux through horizontal surface to  $6.46 \times 10^{-5}$  muons/m<sup>2</sup>/s
  - Water tank cylindrical 6m outer radius and half-height; 1m inner radius and half-height
- FLUKA
  - Raul ran this Dec 2012
  - 20m cubic cavern; same muons as above
  - Livetime calculation same as above
  - Water tank cylindrical 8m outer radius and half-height; 4m inner radius and half-height

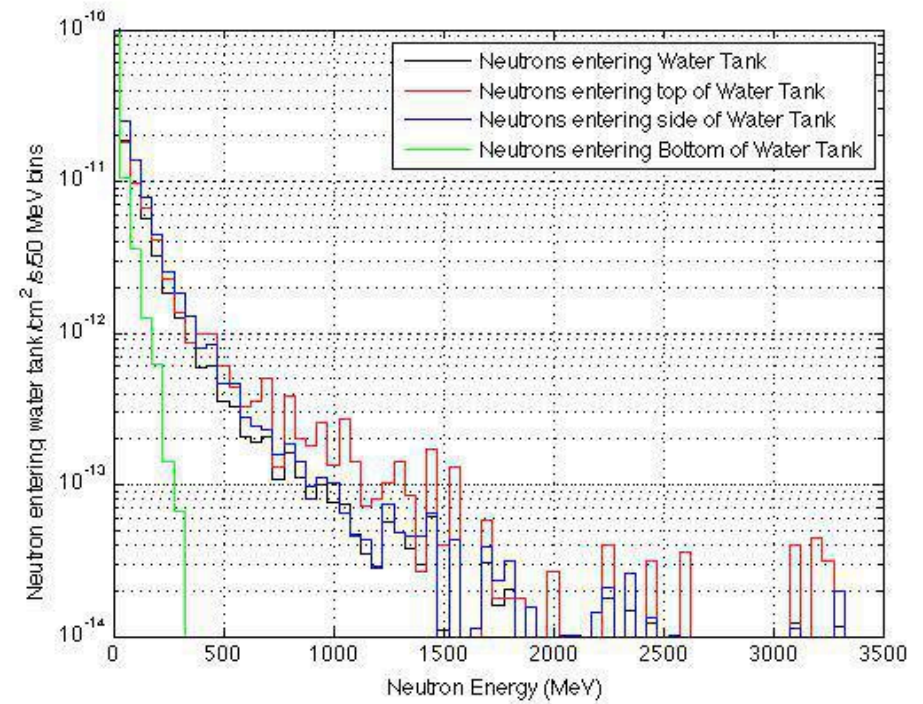
# Rates

Sim	Muons into sides of water	Neutrons top of water >100 keV	Neutrons sides into water >100 keV	Neutrons inside water shield >100 keV
FLUKA	1.75 E-5	1.16 E-6	9.01 E-7	3.23 E-7
Geant4	1.78 E-5	2.70 E-6	1.87 E-6	9.8 E-6

# Neutron Spectra entering water tank

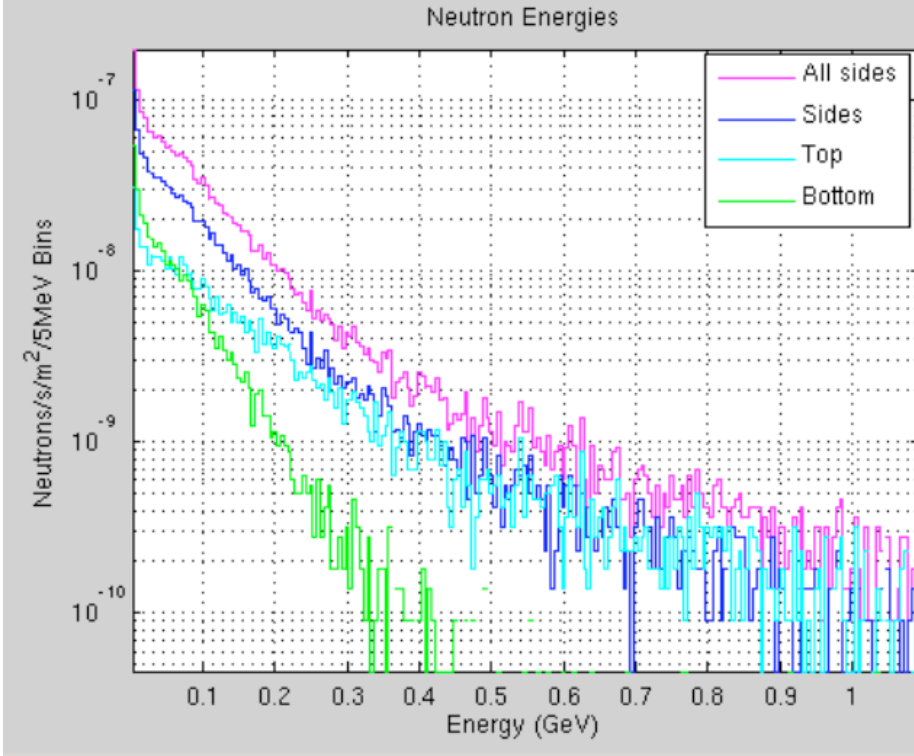


FLUKA

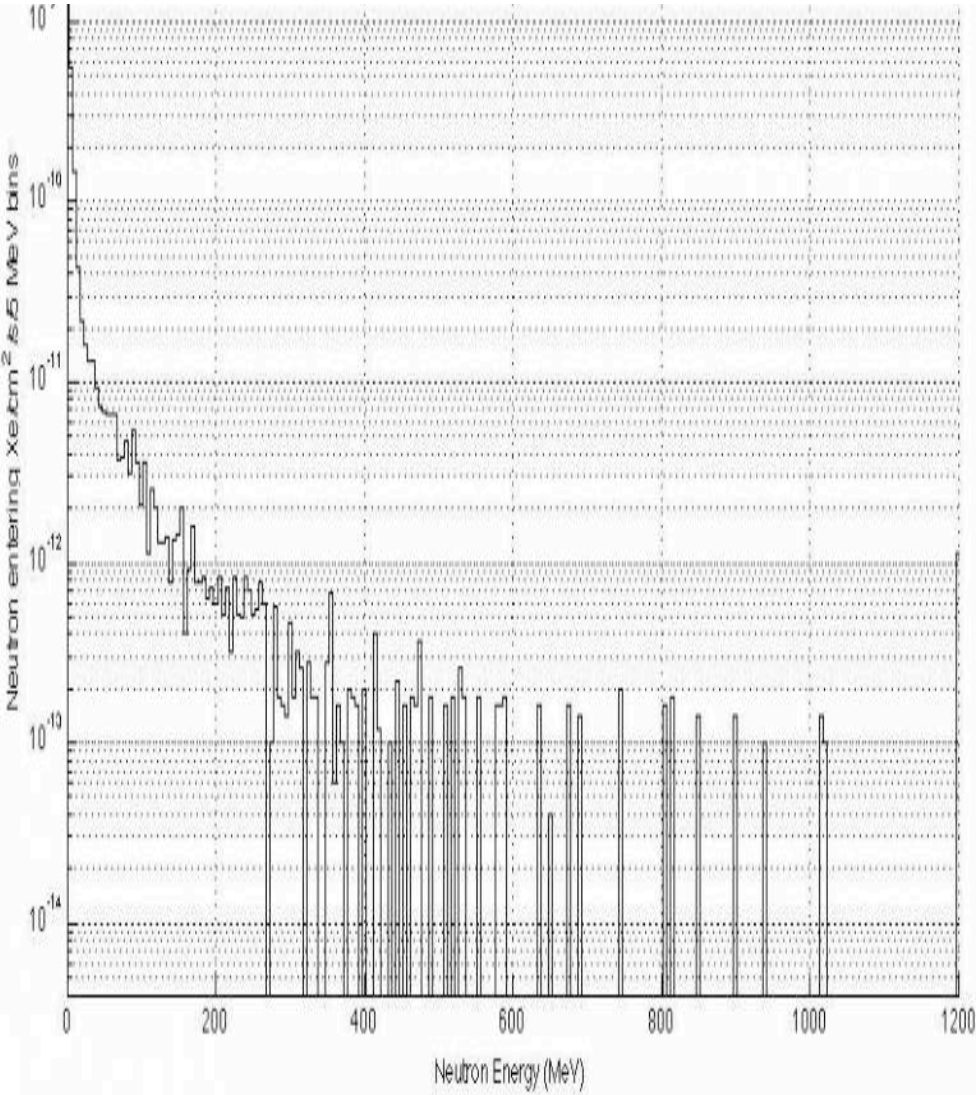


Geant4

# Neutron spectra inside water tank



FLUKA



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