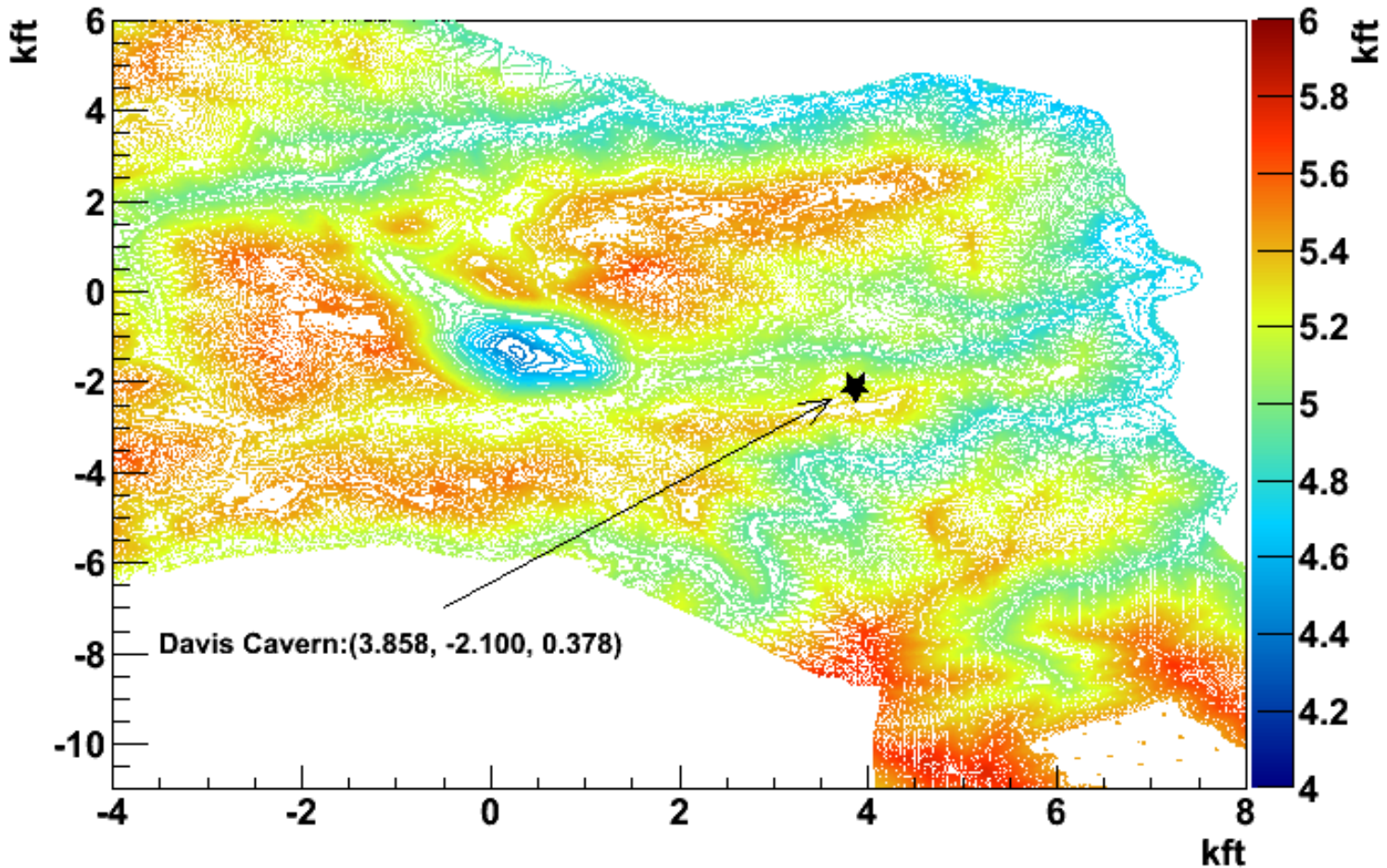


CosmoGenic Backgrounds for Homestake 4850ft Level

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Dec. 12 , 2011

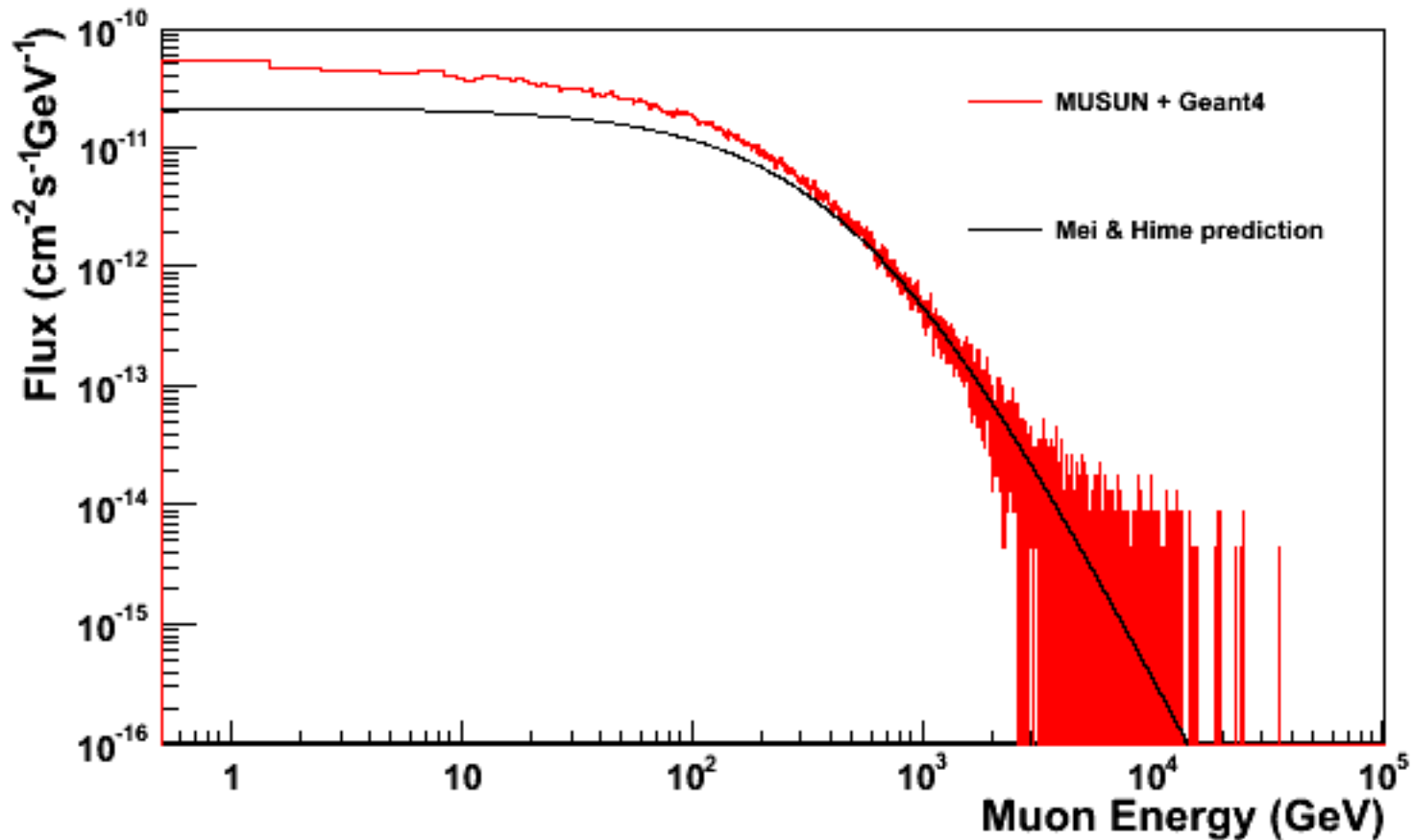
Mountain Profile at Homestak Area



Simulation Input

- MUSUN+G4
 - MUSUN is used to get primary muon spectrum at 4850ft level which adopted Homestake mountain profile and rock composition.
 - Geant4.9.5 is used to take the MUSUN result to penetrate 7 meter rock overburden. Then secondary muon and neutron are obtained.
- Mei&Hime prediction
 - The parameterization function in Mei&Hime paper is used to calculate the muon and neutron distribution at Homestake 4850ft level.

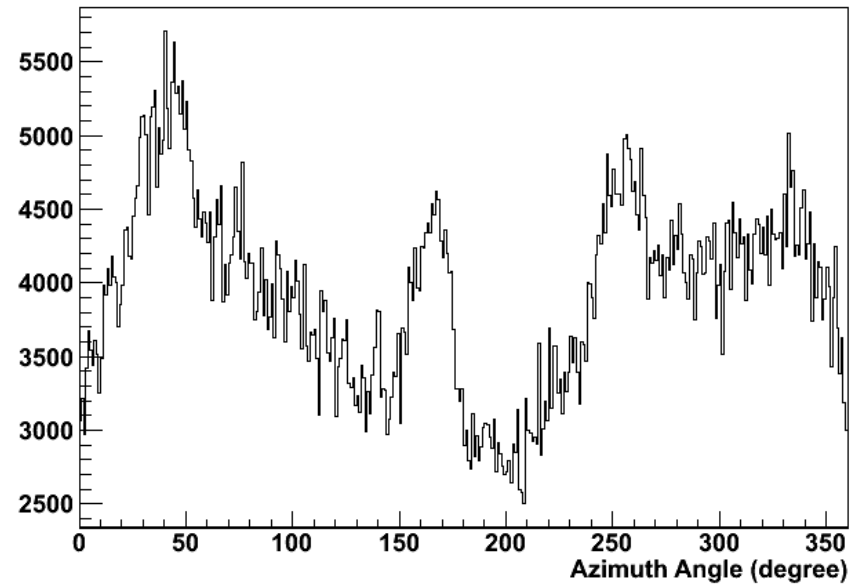
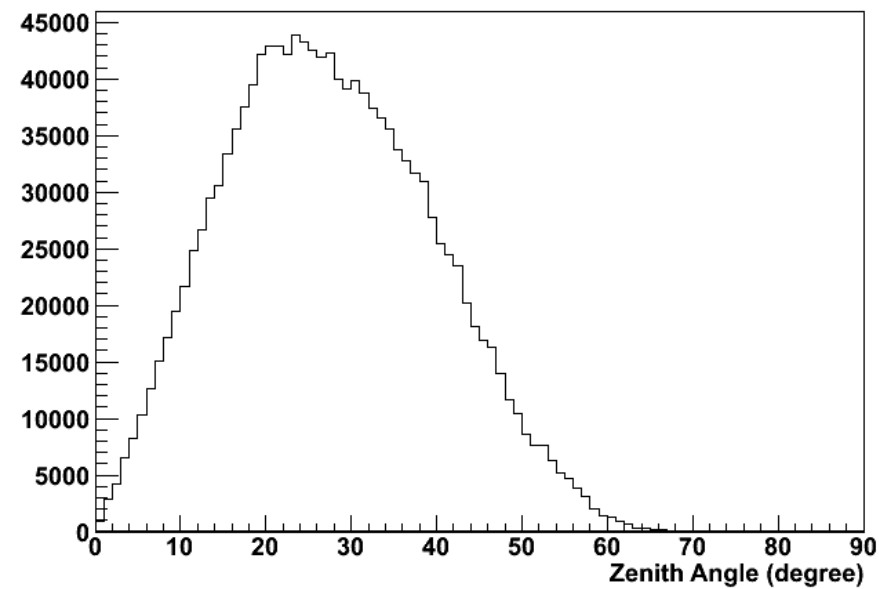
Muon flux at 4850-level



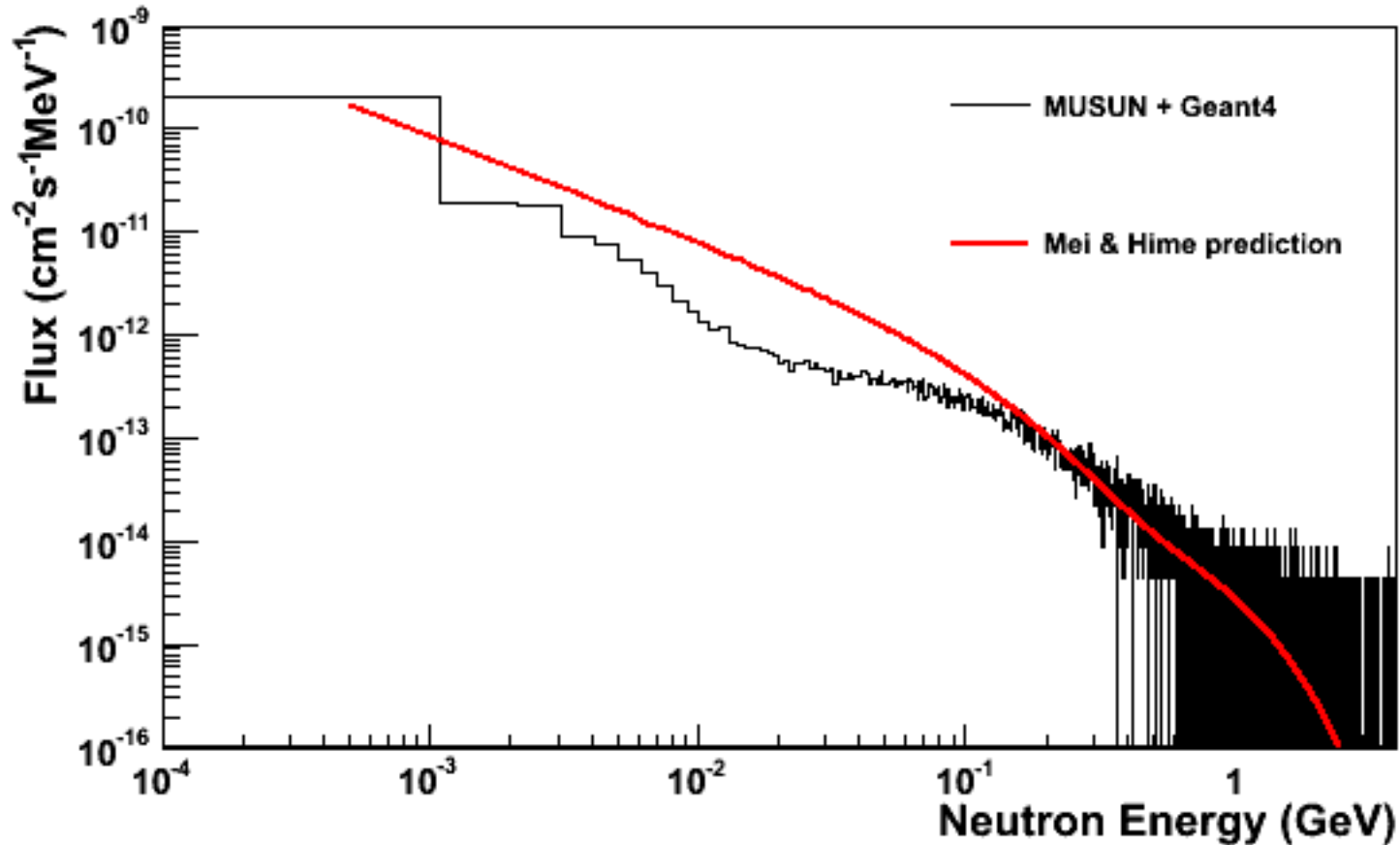
Absolute Flux:

- MUSUN+G4 --- $6.46\text{e-}9\text{cm}^{-2}\text{s}^{-1}$
- Mei&Hime --- $4.40\text{e-}9\text{cm}^{-2}\text{s}^{-1}$

Muon Angle at 4850-level



Neutron flux at 4850-level



Absolute Flux:

- MUSUN+G4 --- 3.41e-10cm⁻²s⁻¹
- Mei&Hime --- 5.39e-10cm⁻²s⁻¹

Neutron Angle at 4850-level

