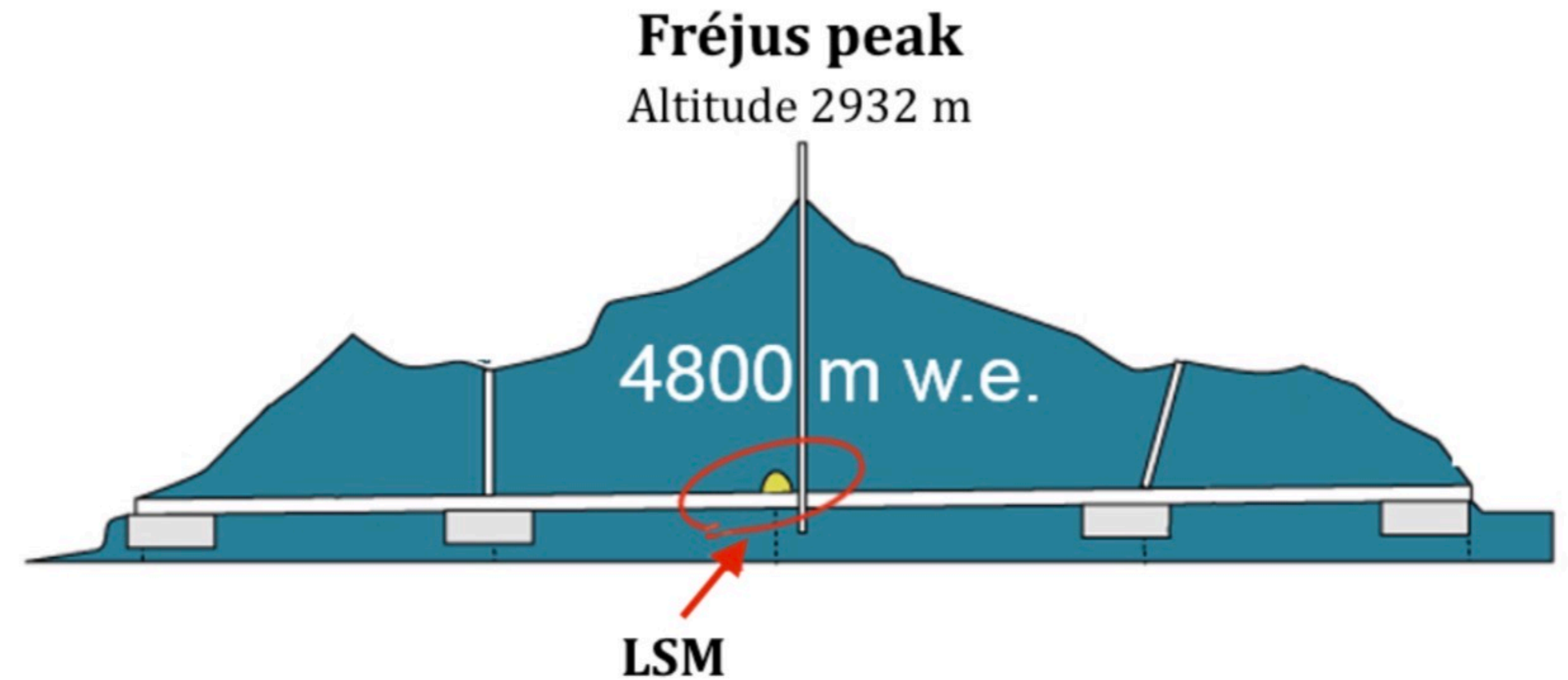


Looking for muons with SuperNEMO

Katherine Curtis-Rose

Motivation

- High energy muons can reach deep underground
- Residual μ flux at LSM $\sim 5 - 10 \mu m^{-2}d^{-1}$
- This muon flux is not well understood and hasn't been studied in detail



What do we want to know about μ ?

- Muon flux (previously measured):

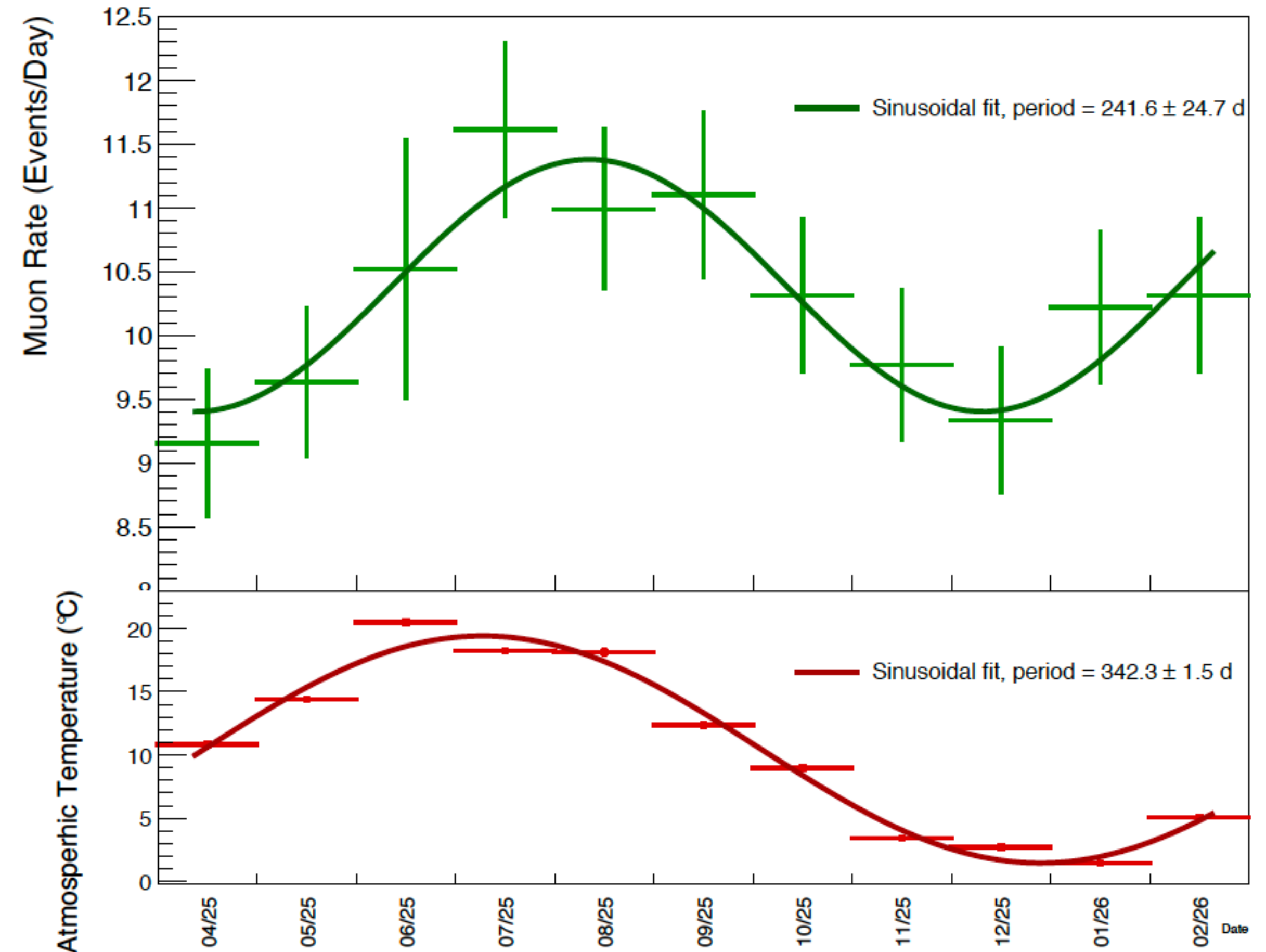
- $\Phi_{\mu,LSM} = (5.47 \pm 0.10) \times 10^{-5} m^{-2} s^{-1}$
(Fréjus, 1989)

- $\Phi_{\mu,LSM} = (6.25 \pm 0.2^{+0.6}_{-0.1}) \times 10^{-5} m^{-2} s^{-1}$
(EDELWEISS, 2013)

- Seasonal variation

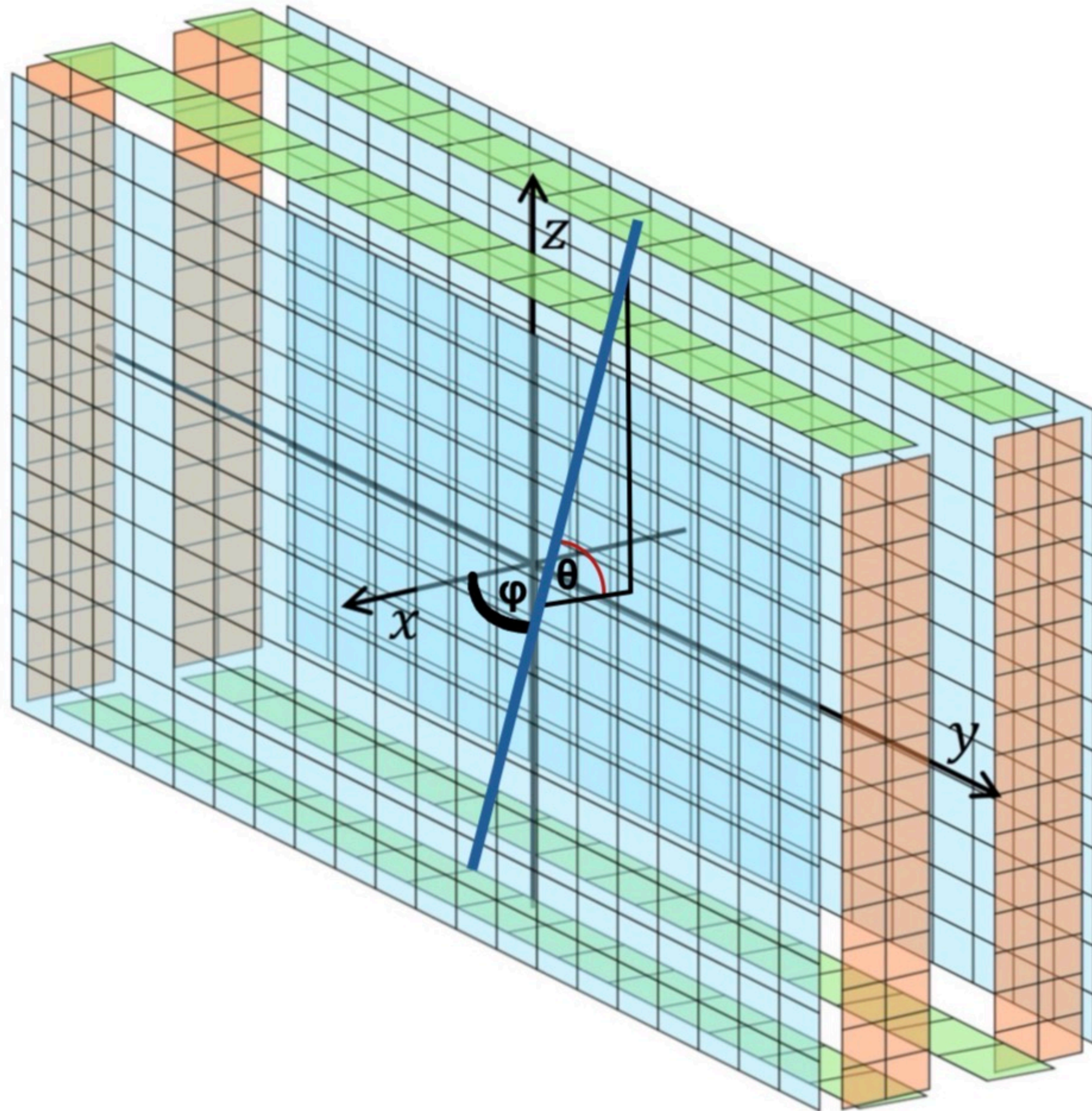
- Energy distribution (current work)

- Angular distribution



Courtesy of S. Pratt

Project plan



What I will do:

- Muon flux and periodicity cross-checks
- Energy spectrum
- Angular distribution
 - Use calorimeter timing to determine direction
 - Preferred elevation angle θ
 - Preferred direction in x-y plane ϕ
- Different μ event topologies

Conclusion

- **High energy muons contribute to the background at SuperNEMO and must be accounted for**
- **We want updated measurements of the residual μ flux, energy spectrum and angular distribution and any other useful info**
- **My project will focus on the properties of the muon flux and different possible event topologies**