

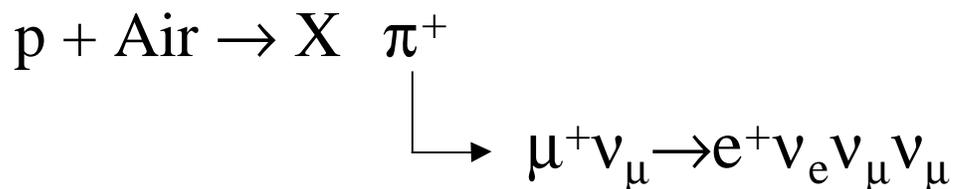
Atmospheric Neutrinos and P907

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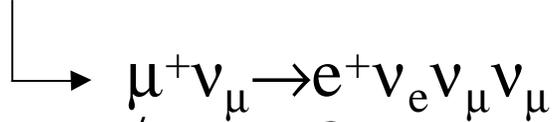
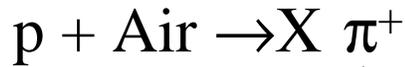
- Atmospheric ν Measurements
- Neutrino Flux Calculations
- P907's Contributions

Atmospheric Neutrinos

- Current measurements compare Monte Carlo predictions with observed events to extract physical results.
- Monte Carlo calculations need input on the incident neutrino flux to arrive at predictions for the rates expected at the detectors.
- A major uncertainty with these calculations is the treatment of hadronic interactions.



Atmospheric Neutrinos



- At low energy: $\nu_\mu / \nu_e = 2$
- When energy increases, we are no longer limited to producing pions as the secondary particles.

K^+ , K^- , K_S , K_L will all contribute

- Estimated 5% uncertainty in ratio below 10 GeV

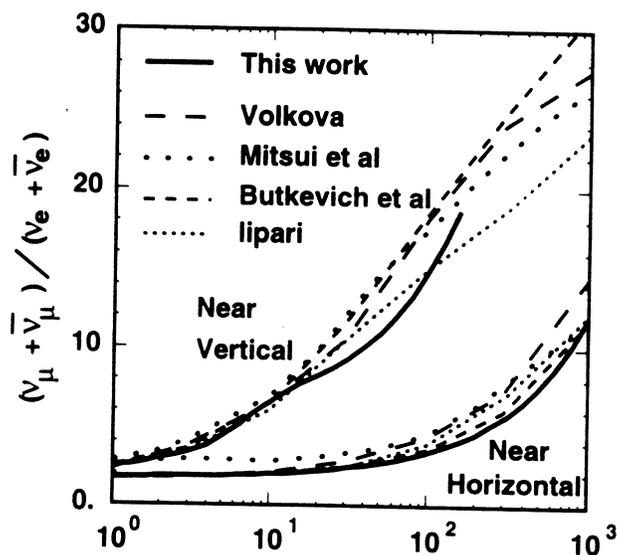
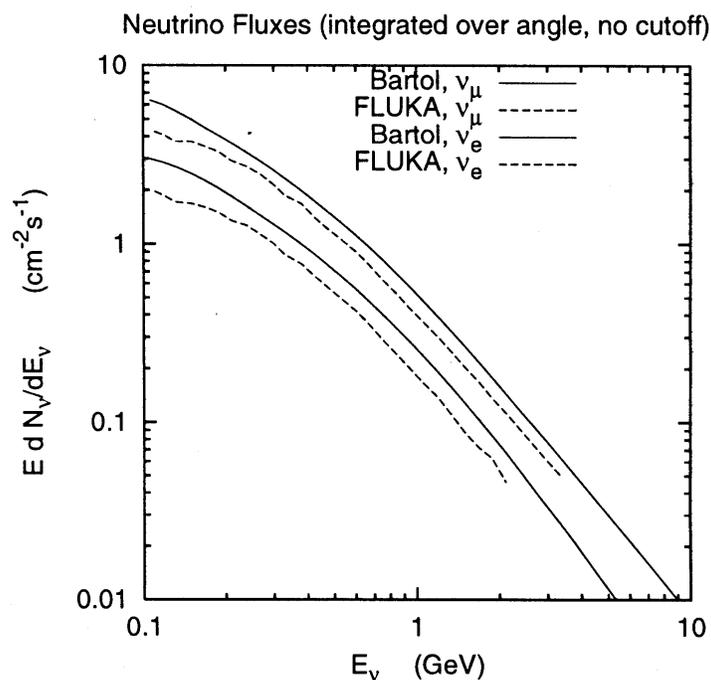


FIG. 18. $(\nu_\mu + \bar{\nu}_\mu) / (\nu_e + \bar{\nu}_e)$ -ratio. Notation is the same as Fig. 14. PRD58,4985

Absolute Flux Prediction



- Absolute flux calculations vary by ^{Hep-ph/0001027} 20% or more.
- Variations primarily due to treatment of hadronic interactions and secondary particle production spectra
- Used for upward going muon fluxes

Contribution of P907

- Need more experimental input on the hadronic interactions to reduce the uncertainty in flux estimates.

– Specifically:



- Study the interactions between 10 GeV and 100 GeV as well as the pion / Kaon spectrum