

B.T.Fleming
June 13th, 2006

Event Rates

- What to calculate
- Tools
- Rates and spectra

What to calculate:

Penultimate detector:

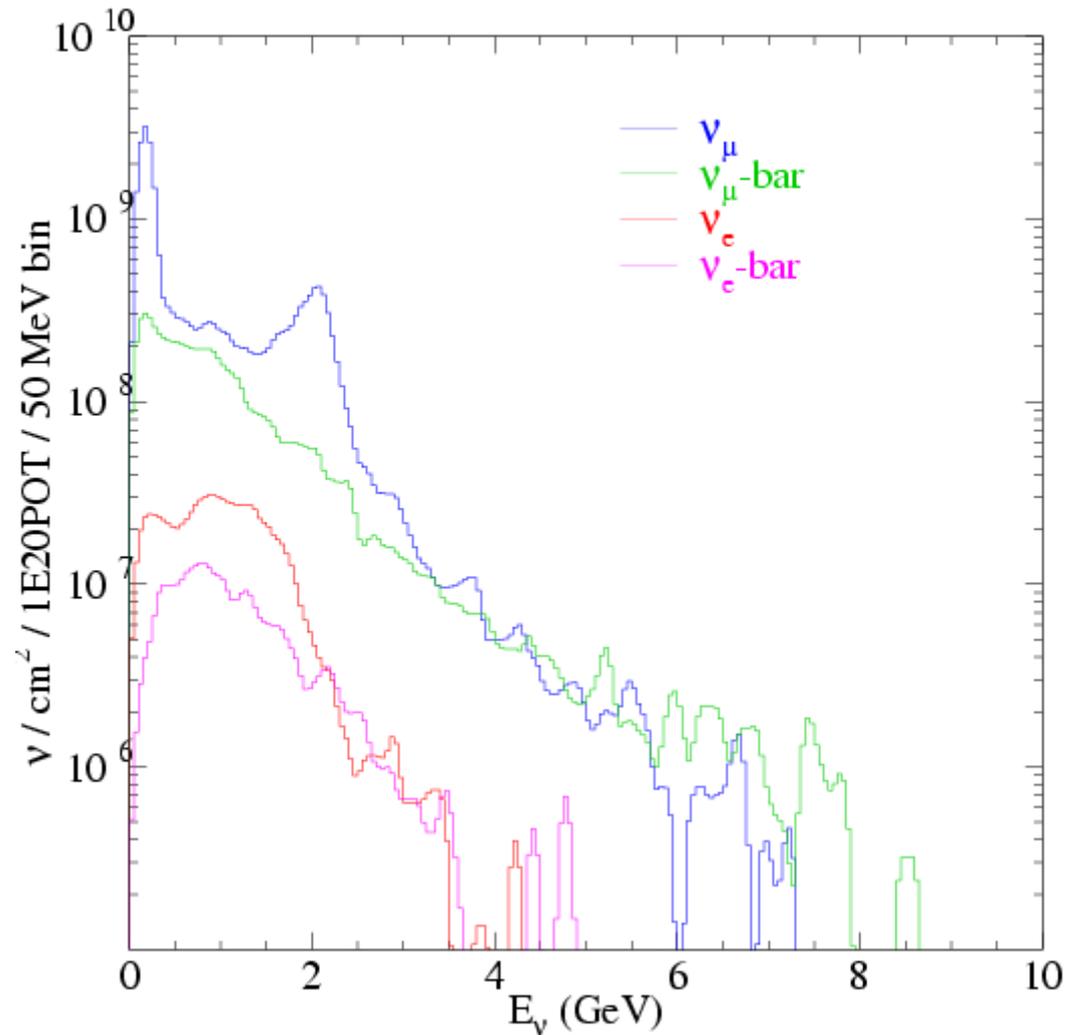
- NuMI near surface rates
- NuMI near underground rates
- Rates at Soudan

Final detector:

- 1st oscillation max
- 2nd oscillation max
- DUSEL site

How rates are calculated:

Start with Mark Messier's flux tool (Gfluka fluxes) for fluxes $> 1\text{km}$, or specific fluxes pre-calculated



Run through NUANCE:

-Lwellyn-Smith for CCQE

-Rein and Seghal for Resonant

-Bodek-Yang for DIS

-folds in nuclear effects, final state interactions, ...

-vetted by various experiments including MiniBooNE

modified for LAr ->

-target centers

-nuclear effects scaled for LAr

-no final state interaction mods.

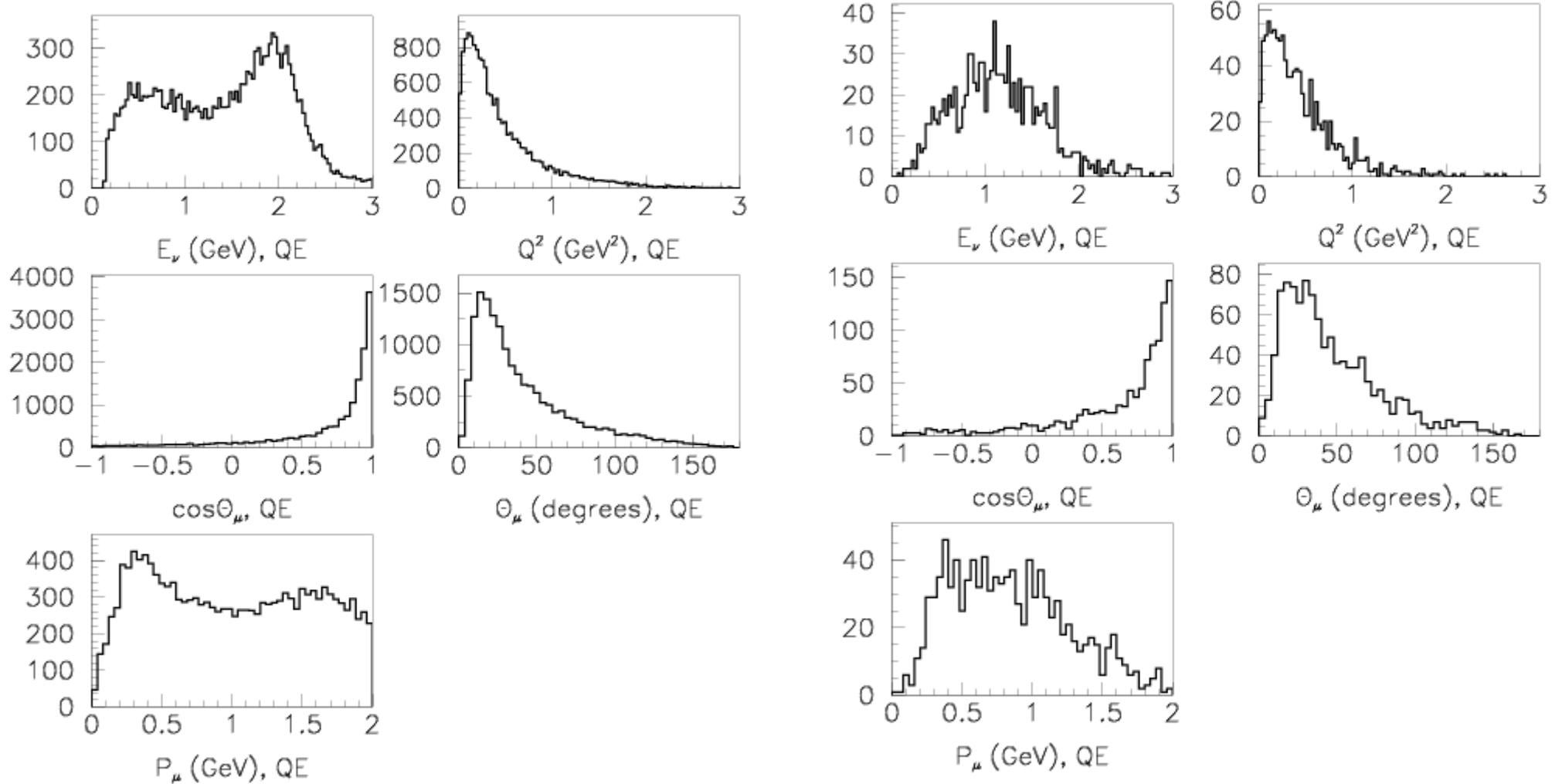
*Thanks to Alessandro
for running fluxes
and NUANCE*

NuMI Surface rates

NUANCE predicted number of events,
1 kton, 3.7E20 POT
numi-surf-le-11-97-911

cocktail	414,267
numu total	393,021
numu CC	292,162
numu QE	132,878
nue total	21,246

NuMI surface spectra



Summary/todos:

Lots of events at NuMI surface location!
-important for arguments towards cross section measurements

What are the rates at Soudan?
(easily determined from MINOS rates
->Run LAr NUANCE as well)



Sensitivites for nue appearance measurement