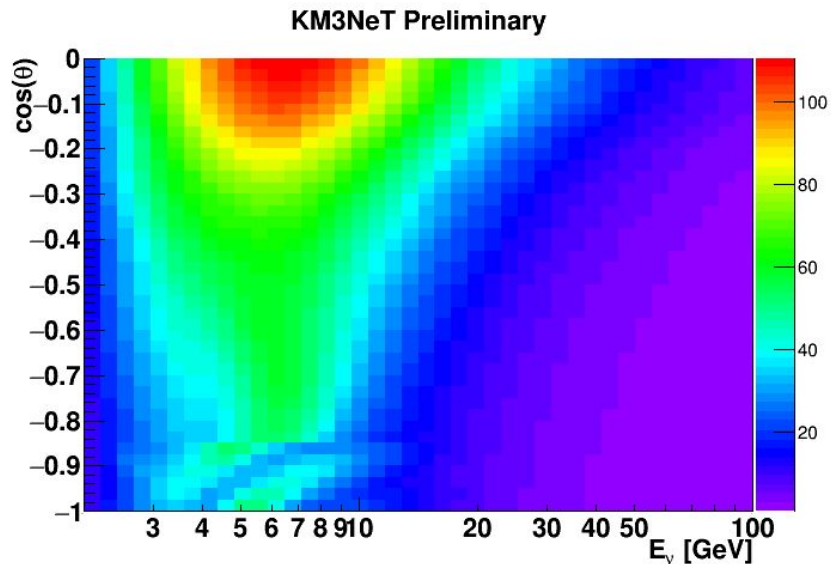


Progress

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On paramNMH

Plots graphs of the number of detections at certain angles and energies.



Example

For $N_{\nu e} - E_{\nu} - \text{flav} - 2\text{dim}$ (true energy) with

[flavor(1,2,3)] [th23/deg] [delta_CP/deg] [NMH(1,-1)]

1 45 0 1

How this works

We look into Nev-Enu-flav-2dim, stands for

- 3 years operation
- True energy
- Plots certain flavour

Overall

- Calculate events over 3 years
- Fits for experiment measurements
- Sensitivity, significance of measurements

How this works

- Doing 'fit'
- For each angle
- Calculates zenith value and creates path
 - Using Prem Model from OscProb: 'implements earth model with spherical shells'
- Sets path for oscillations in matter and chirality
 - Using Fast PMNS from OscProb
- For each energy
- Get numbers/ratio of electron and muon (anti-)neutrinos
 - Using 'Honda' Neutrino Flux data, frj-ally-20-01-solmin.dat
- Calculate total events using above and factor
 - $\text{getNeutrinoCrossSection()} * \text{getNucleonsPerMegaton()} * \text{getSecondsPerYear()} * \text{nyear}$

How this works

- Estimated uncertainties exist
- Find the sensitivity of the experiment
 - Using Fast Fit
- Uses estimated uncertainties

Uncertainties

- $\text{SIGMA_THETA_13} = 0.15;$ NuFit
- $\text{SIGMA_DM_23} = 0.033\text{e-}3;$ NuFit
- $\text{SIGMA_NUNUBAR} = 0.03;$ (anti-)neutrino ratio
- $\text{SIGMA_NUENUBAR} = 0.1;$ nue(bar) ratio
- $\text{SIGMA_NUMUNUBAR} = 0.1;$ numu(bar) ratio
- $\text{SIGMA_TRACK} = 0.1;$ muon contribution
- $\text{SIGMA_SHOWER} = 0.1;$ electron contribution
- $\text{SIGMA_NC} = 0.1;$ NC contribution
- $\text{SIGMA_SPECTRAL} = 0.05;$ Lol
- $\text{SIGMA_ESCALE} = 0.1;$ energy
- $\text{SIGMA_SKEW} = 0.05;$ skew
- How are (some) of these determined?

Uncertainties

- Other uncertainties
- Uncertainties DOM position
 - Leads to uncertainties in event detection and position/angles
- How does this affect our results?
- Example

