MC, Acceptance, Efficiency

Events

$$Triggers = Reconstructed = N_{reco\ tot} = int\ tot\_events = amschain \rightarrow GetEntries(\quad);$$

$$Generated = N_{gen\ tot} = \left.\frac{triggers}{events}\right|_{Choutko\ DB} \cdot N_{reco\ tot}\ , \qquad \left.\frac{triggers}{events}\right|_{Choutko\ DB} = f_{trig\ tot}$$

MC Acceptance

$$A_{gen.\,pl} = geom.\,factor = \pi l^2 = \pi(3.9)^2 = 47.7836\ m^2 \cdot sr$$

$$\mathcal{A}_{reco}(Cut) = \frac{N_{reco}(Cut)}{N_{gen}(Cut)} \cdot A_{gen.\,pl} \qquad Cut = Cut\ (E, \Omega, x, y) = Cut(\theta, \phi, Rig, x, y)$$

$$\mathcal{A}_{trig}(\theta, \phi, Rig, x, y) = \frac{N_{reco}(\theta, \phi, Rig, x, y)}{N_{gen}(\theta, \phi, Rig, x, y)} \cdot A_{gen.\,pl}(\theta, \phi, x, y) = \frac{A_{gen.\,pl}(\theta, \phi, x, y)}{f_{trig}(\theta, \phi, Rig, x, y)}$$

MC Efficiency

$$\varepsilon_{MC}(Cut) = \frac{N_{reco}(Cut)}{N_{reco}(Before\ Cut)} = \varepsilon(TRKtrack, TRD, TOF, ECAL) \xrightarrow{Cuts}$$

Fluxes

$$\Phi_{meas} = \frac{N_{detect}(Cut)}{\mathcal{A}_{trig}(\theta, \phi, Rig, x, y) \cdot \varepsilon_{MC}(Cut)} \cdot \frac{1}{\Delta T} \cdot \frac{1}{\Delta Rig}$$

$$A_{Subdetector} < 1$$

Subdetectors Acceptances

$$A_{AMS}(trig + TRKtrack = TOF) \approx 0.45\, m^2 \cdot sr \qquad A_1(TRD + TOF + InnTRK) \approx 0.141\, m^2 \cdot sr$$

$$A_2(TRD + TOF + FullTRK) \approx 0.04\, m^2 \cdot sr \qquad A_3(TRD + TOF + ECAL + FullTRK) \approx 0.025\, m^2 \cdot sr$$

General formula for one surface S telescope

$F(\Omega) = 1$: *isotropic intensity*

$$A_{gen.\,pl}(\theta, \phi, x, y) = A_{geom}(\theta, \phi, x, y) = \int_{\Omega} d\Omega \int_{S} d\boldsymbol{\sigma} \cdot \hat{\boldsymbol{r}}\, F(\Omega) =$$

MAX = (AMS) $S \int_0^{2\pi} d\phi \left| \int_0^1 cos\theta d cos\theta \right| = 2\pi l^2 \left| \int_0^{\pi/2} cos\theta sin\theta d\theta \right| = \pi l^2$

For a 2-1 bin = $(x_2 - x_1)(y_2 - y_1)(\phi_2 - \phi_1)\frac{1}{2}|cos^2\theta_2 - cos^2\theta_1|$

Distributions:
Random uniform in $x, y, \phi, cos^2\theta$, Log(Rig)

Number of Events per bin

$$x \to \frac{N_{gen\,tot}}{\#bins[x]} \qquad \phi \to \frac{N_{gen\,tot}}{\#bins[\phi]} \qquad R \to N_{gen\,tot} \cdot \frac{Log\left(\frac{R_2}{R_1}\right)}{Log\left(\frac{R_{max}}{R_{min}}\right)}$$

$$y \to \frac{N_{gen\,tot}}{\#bins[y]} \qquad \theta \to N_{gen\,tot} \cdot |cos^2\theta_2 - cos^2\theta_1|$$