Nikhef Meeting

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I take a sphere of radius 50 m around the shower vertex and a time window of 20 ns.

$$\mathcal{L} = \underbrace{\sum_{\text{no hit}} e^{-E \times PDF(z,R,\cos\theta_{\text{impact}})}}_{\text{Poisson probability of no hits}} + \underbrace{\sum_{\text{hit PMTs}} 1 - e^{-E \times PDF(z,R,\cos\theta_{\text{impact}})}}_{\text{Poisson probability of 1 or more hits}}$$

The expected K40 rate is also added to the PDF value. Angle of impact is defined assuming the photon had originated at the vertex.

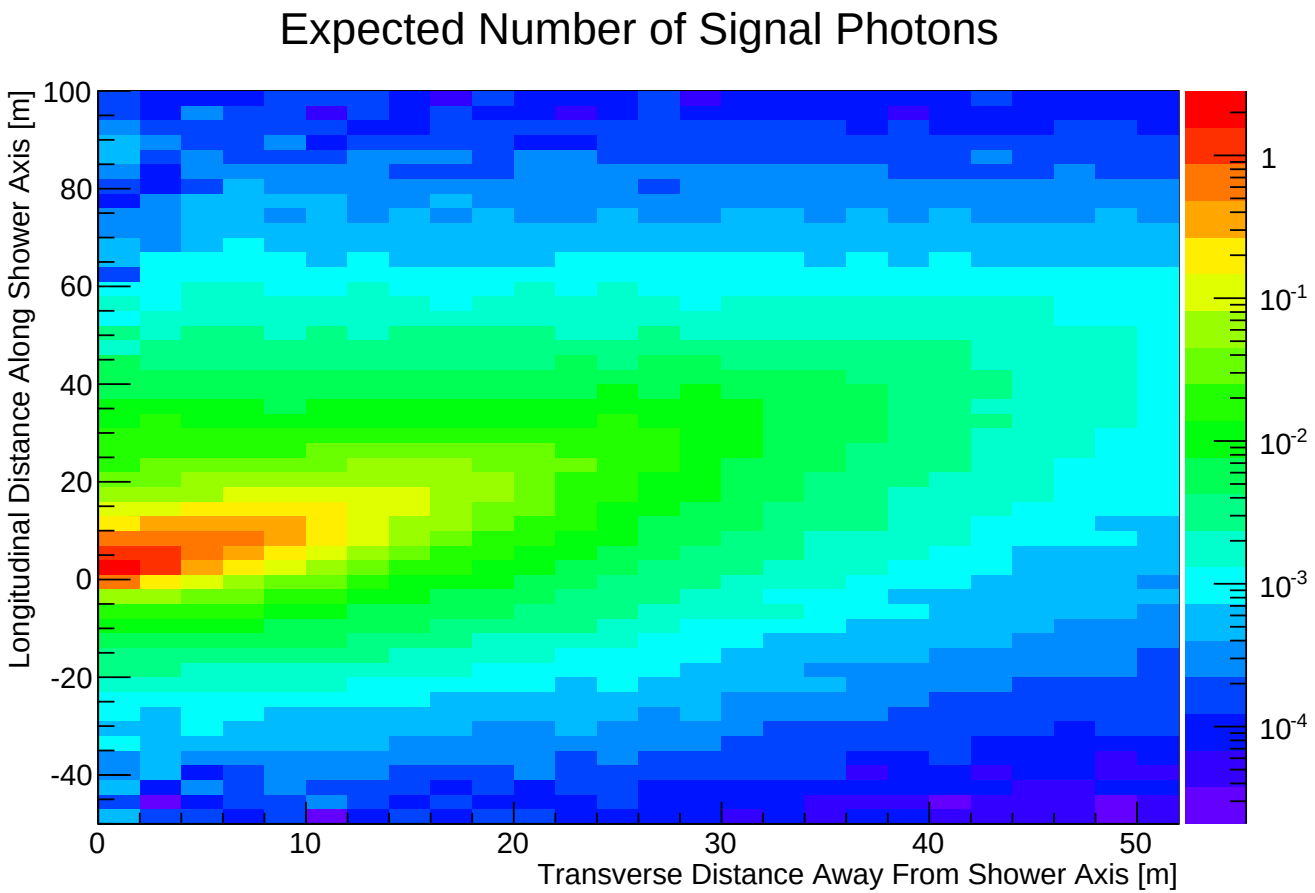

Figure 1: A 2D projection of the PDF used for the EM shower fit.

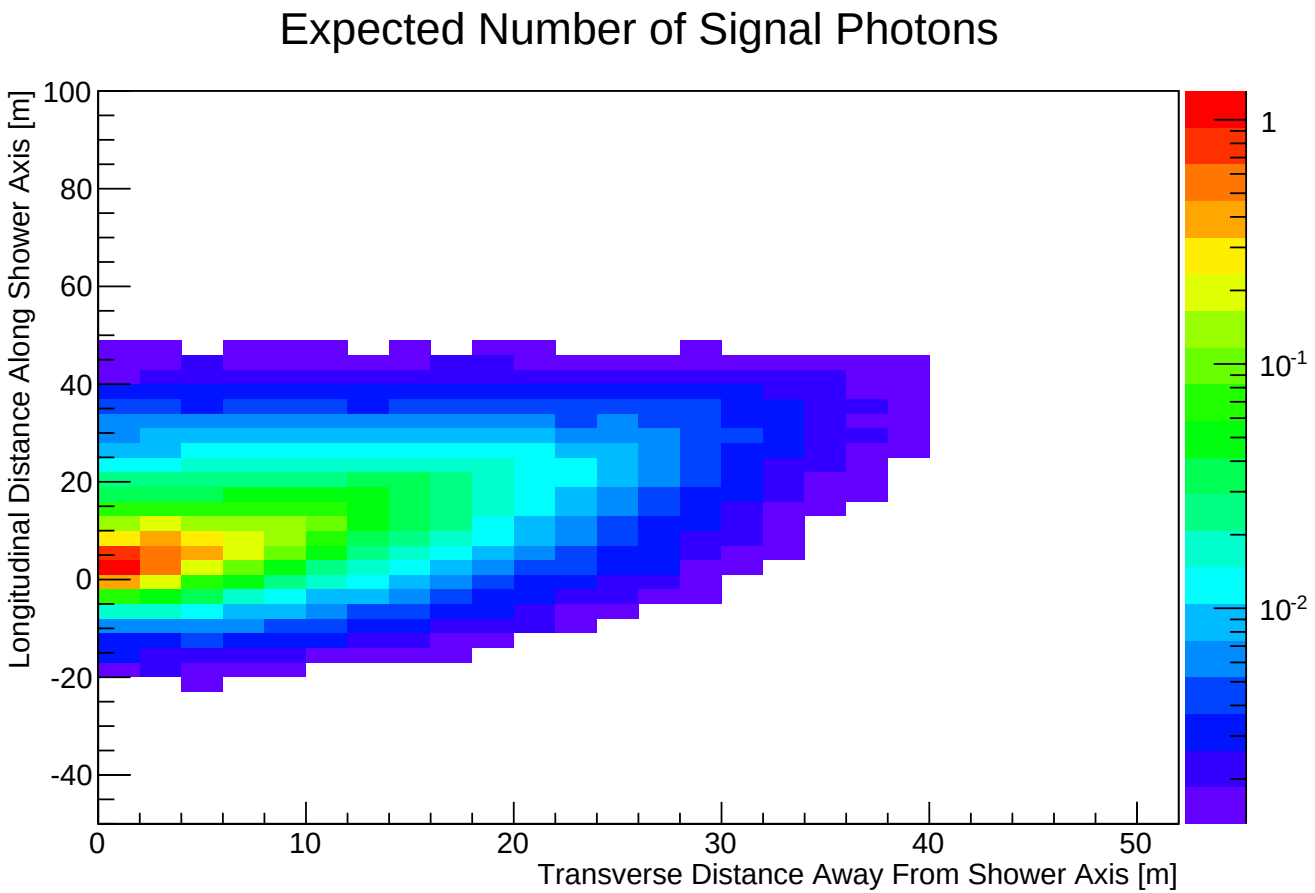

Figure 2: A 2D projection of the PDF used for the hadronic shower fit.

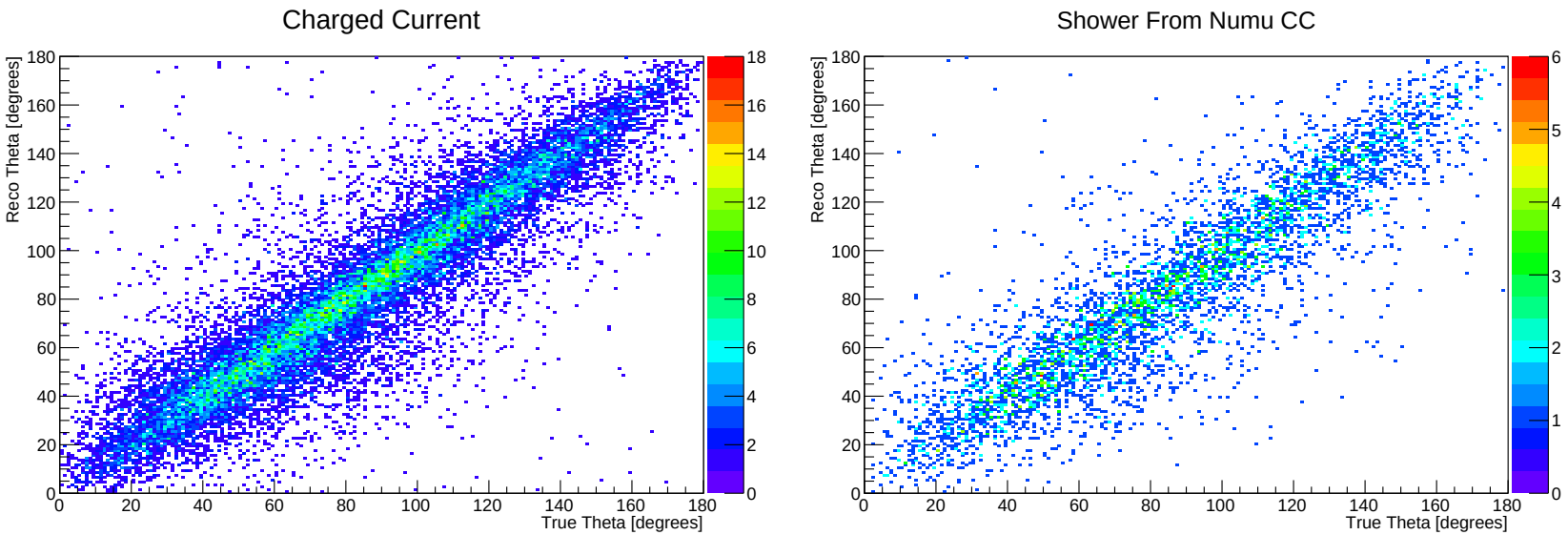

Figure 3: True vs Reconstructed theta for EM (left) and hadronic (right) showers

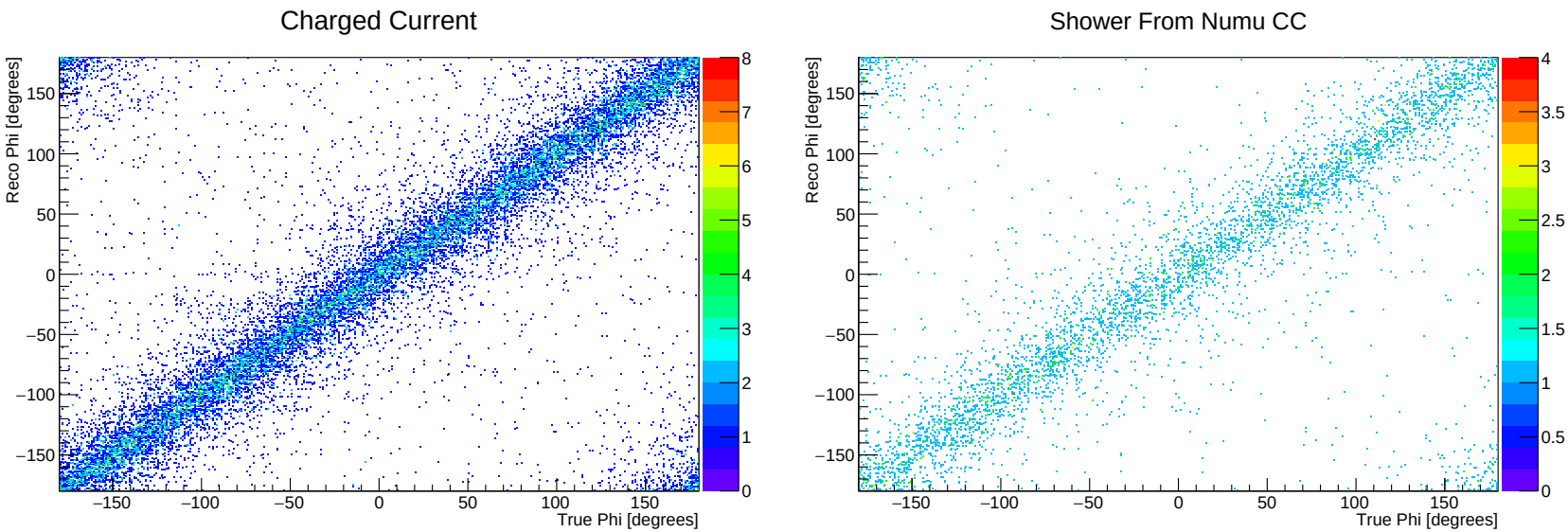

Figure 4: True vs Reconstructed phi for EM (left) and hadronic (right) showers

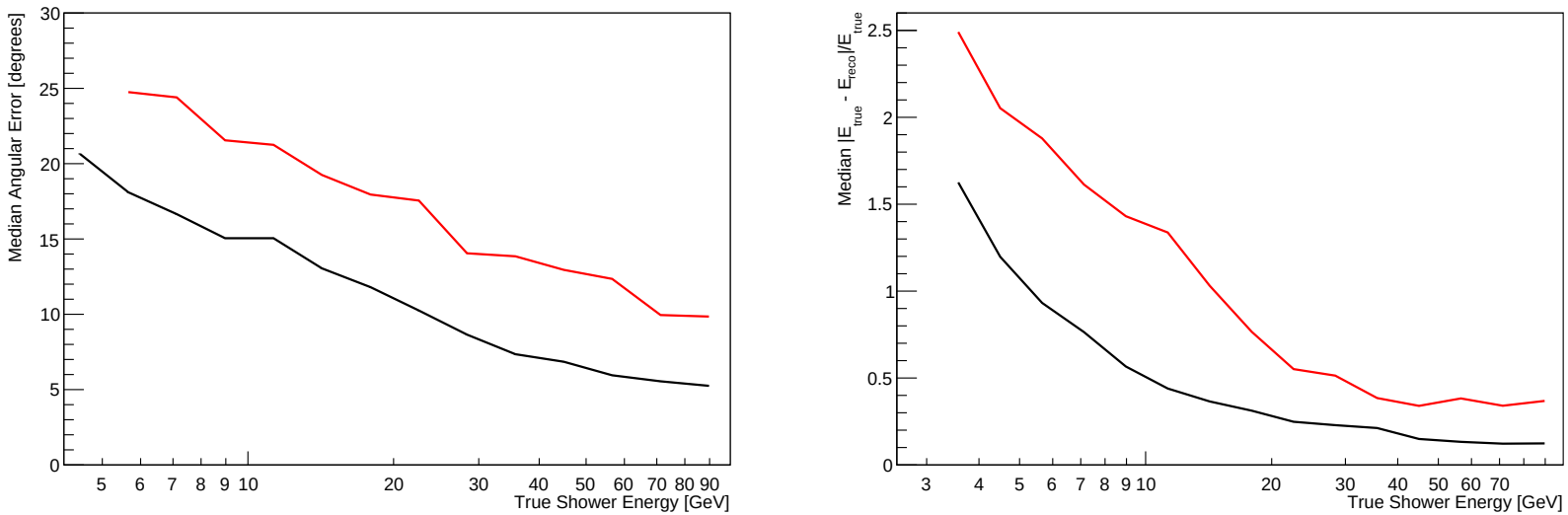

Figure 5: Angular resolution (left) and energy resolution (right) for hadronic (red) and EM showers (black).