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Track Direction Reconstruction and Noise Filtering for TRIDENT Phase-I

Qichao Chang / 常起超

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Tsung-Dao Lee Institute, Shanghai Jiao Tong University

中国物理学会高能物理分会

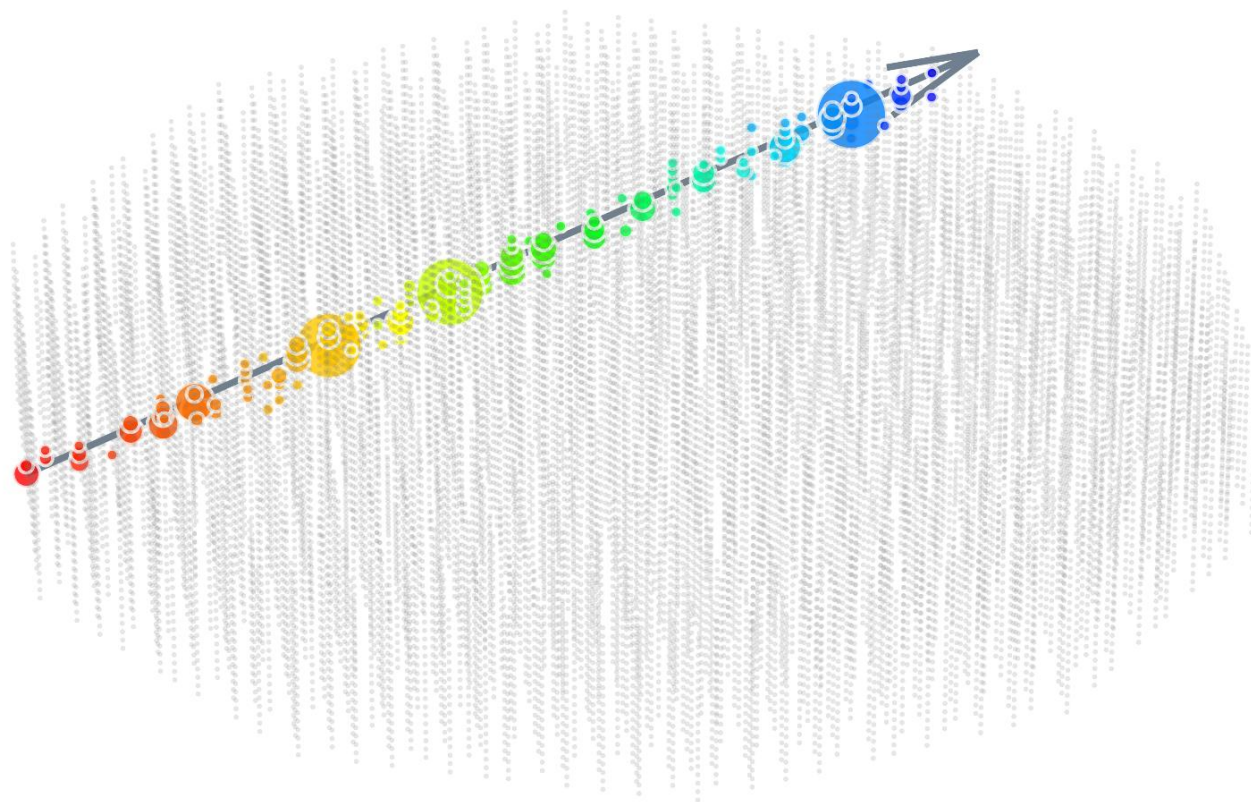
➡ Motivation



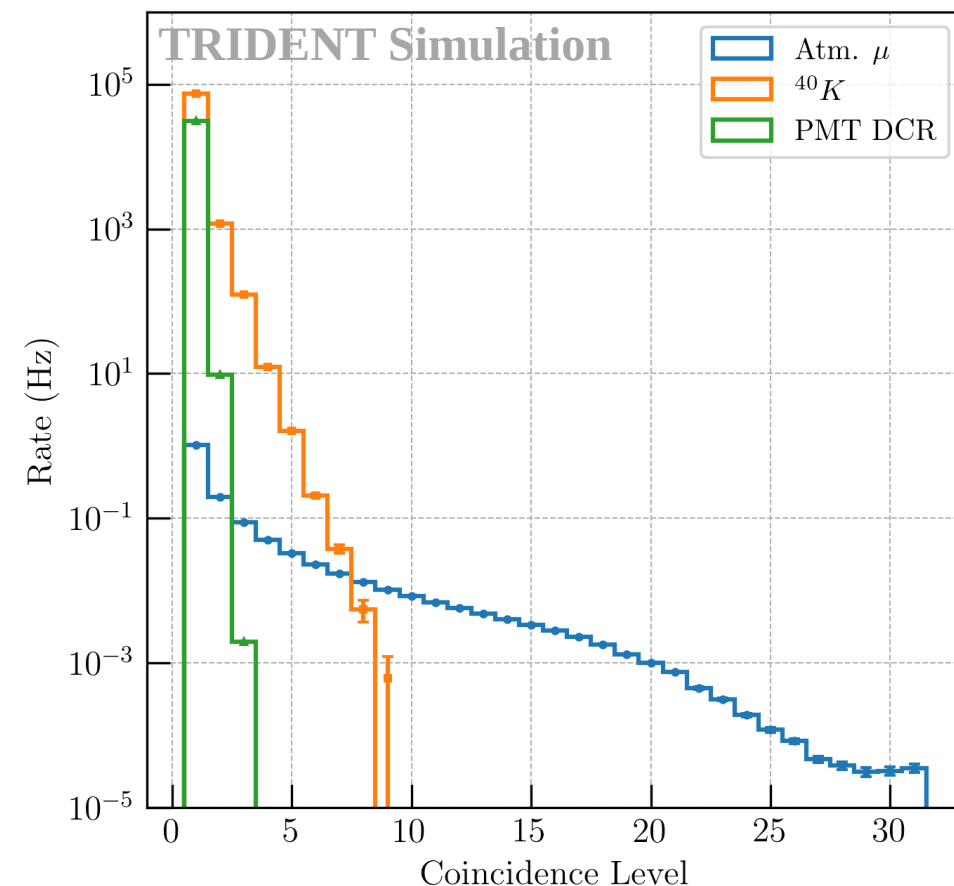
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Detect muon neutrinos



Background hits challenge reconstruction

➡ Reconstruction and Filtering



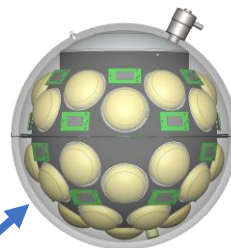
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$$\text{DOM}_i(\vec{x}_i, \text{PMTid}_i, t_i)$$

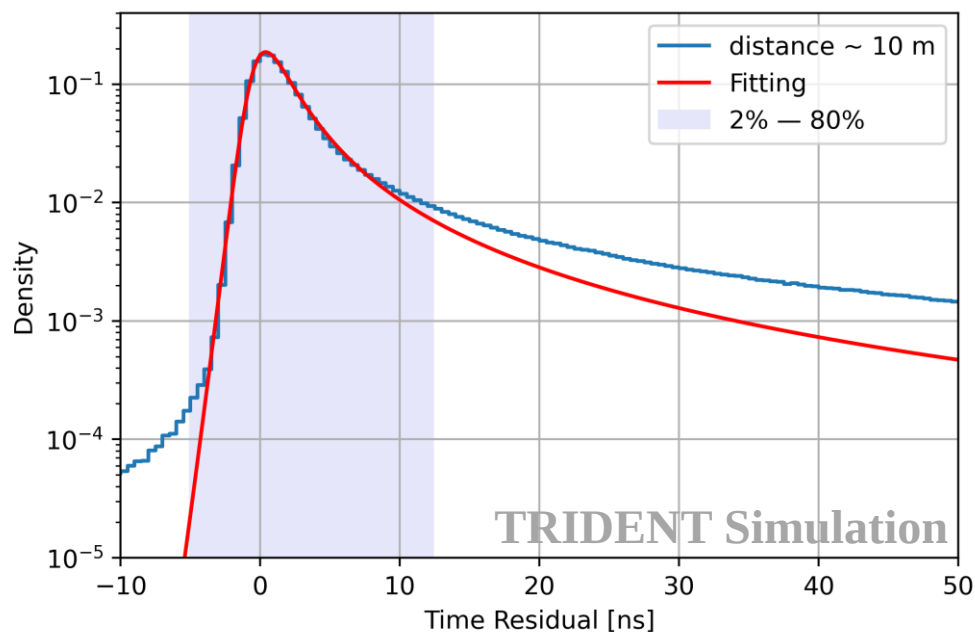
$$\mathcal{L}(t_{\text{res}}, d, \cos) = p(t_{\text{res}}, d) * p(\cos)$$



d

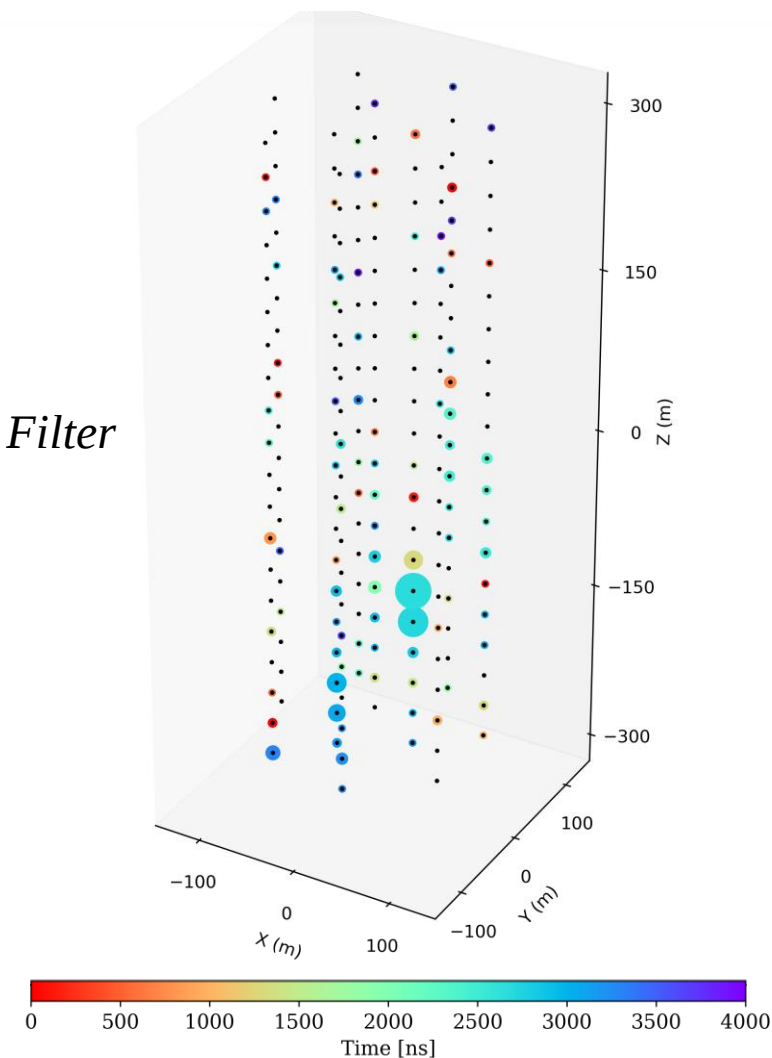
$$\mu(\vec{x}_\mu, t_\mu, \hat{n}_\mu)$$

θ_{CK}



Noise Filtering based on max-hit DOM

Before Filter



➡ Reconstruction and Filtering



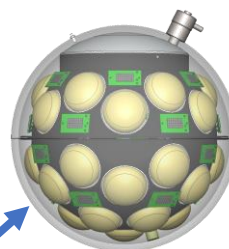
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$$\text{DOM}_i(\vec{x}_i, \text{PMTid}_i, t_i)$$

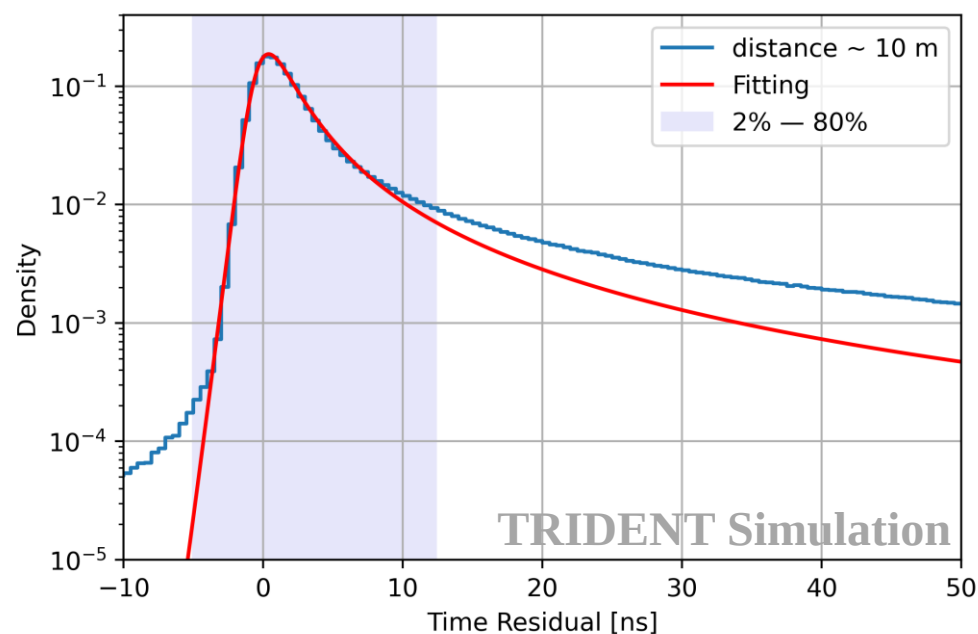
$$\mathcal{L}(t_{\text{res}}, d, \cos) = p(t_{\text{res}}, d) * p(\cos)$$



d

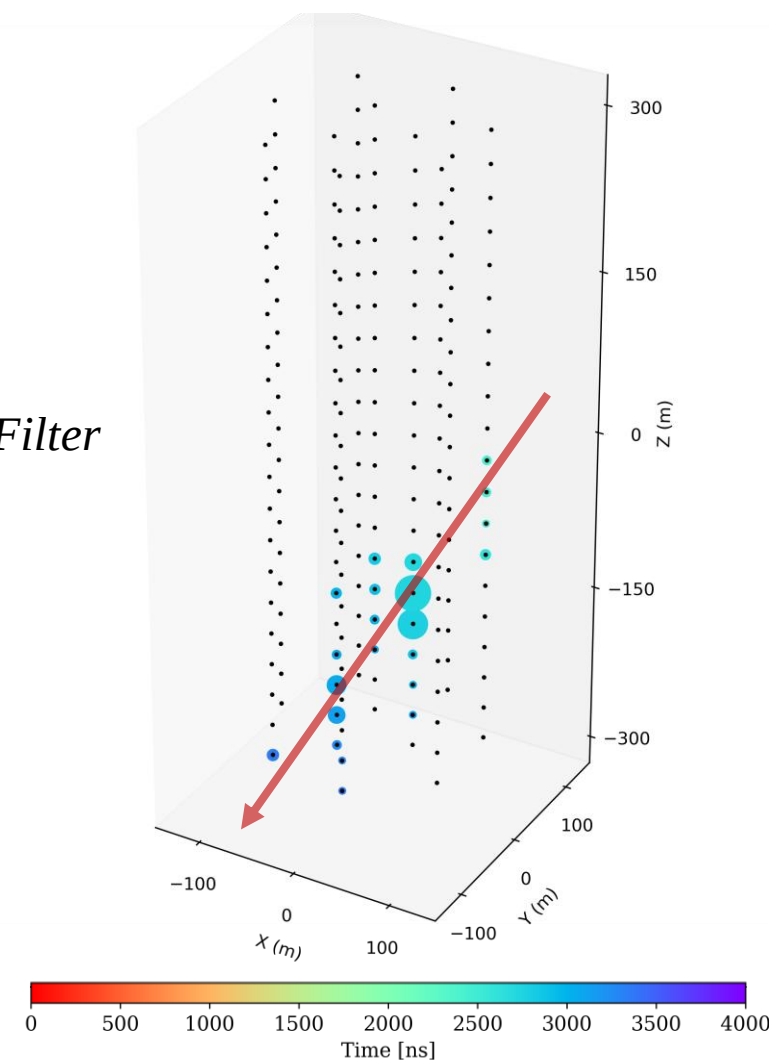
$$\mu(\vec{x}_\mu, t_\mu, \hat{n}_\mu)$$

θ_{CK}



Noise Filtering based on max-hit DOM

After Filter



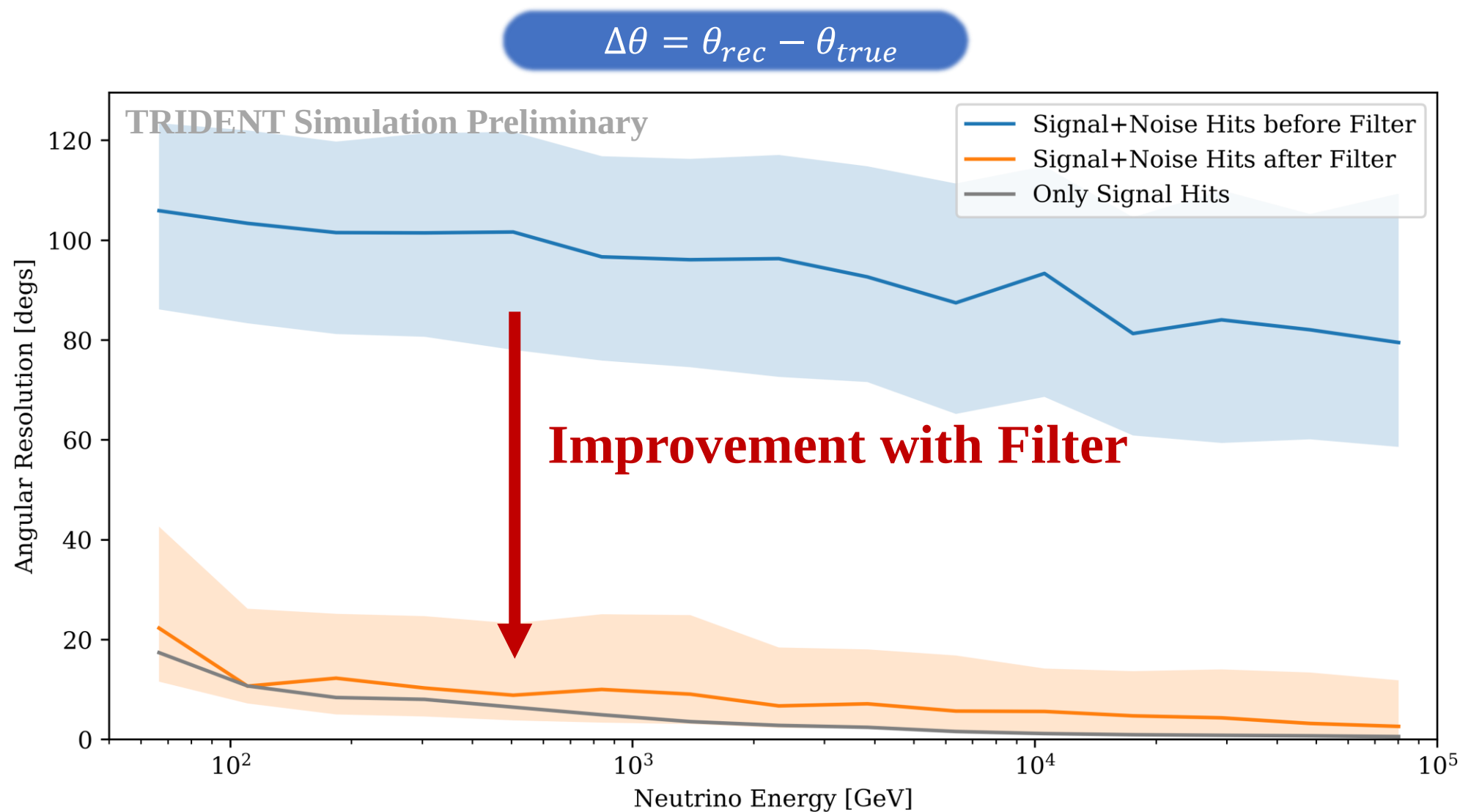
➡ Preliminary Results



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Thank you!