A Horizontal Geometry Study with NuRadioMC

Yue Pan

David Seckel

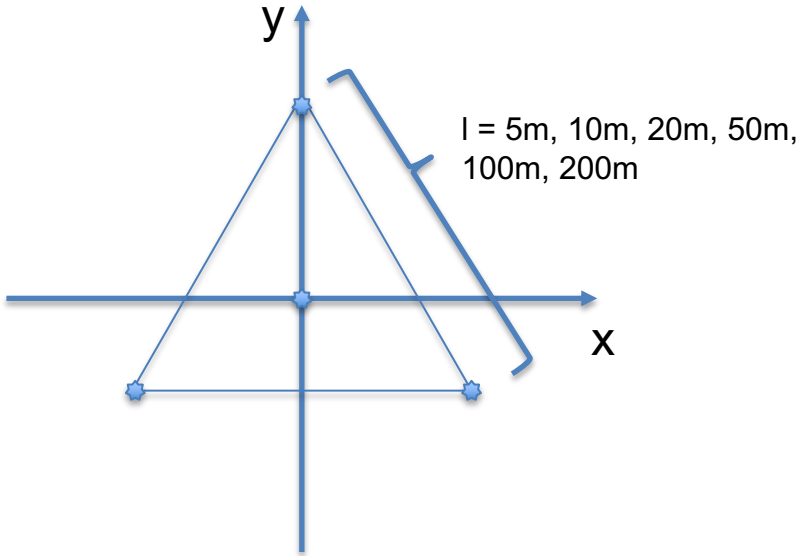
University of Delaware

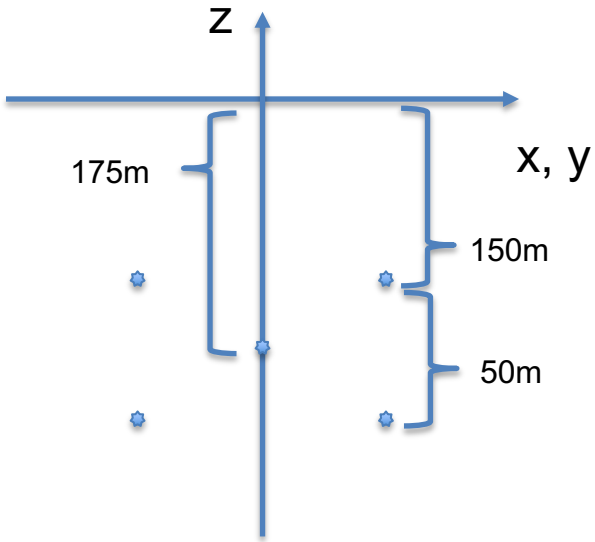
Purpose

To study the angular and distance reconstruction ability of a station with different horizontal sizes (5m, 10m, 20m, 50m, 10m, 200m)

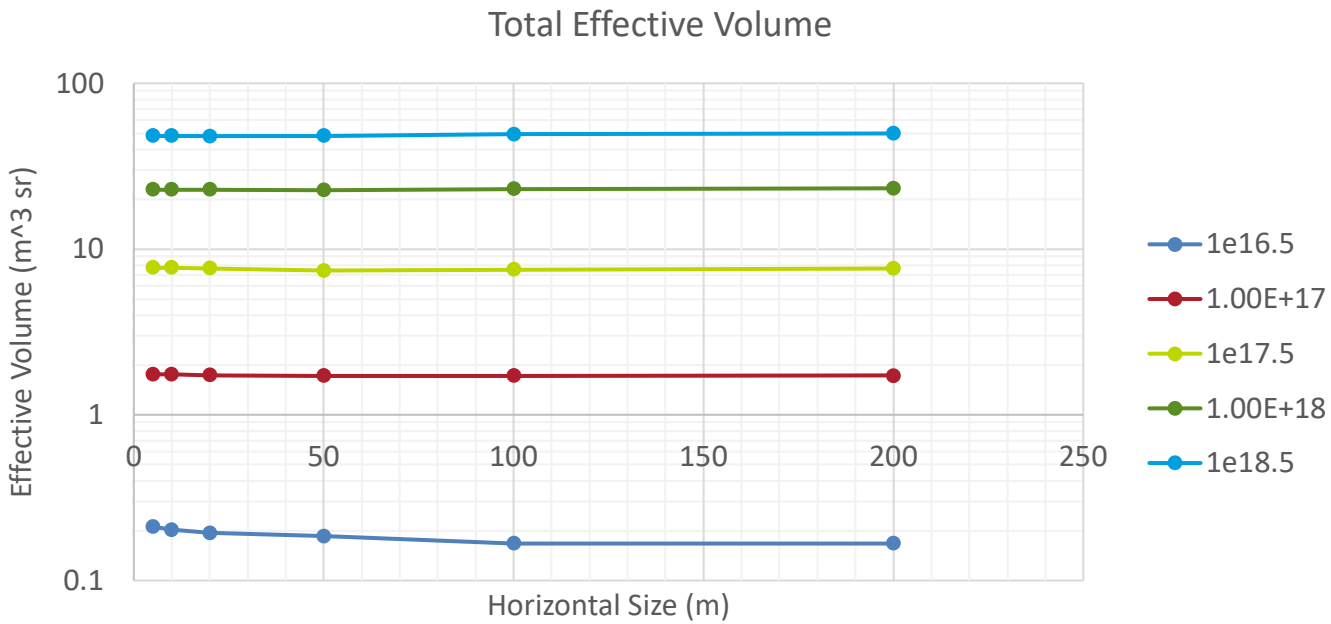
Station Config

Trigger Logic:
1 / 1 on the central bicone (phase array) at 1.6 rms
OR
3 / 6 on the peripheral bicones at 4.2 rms

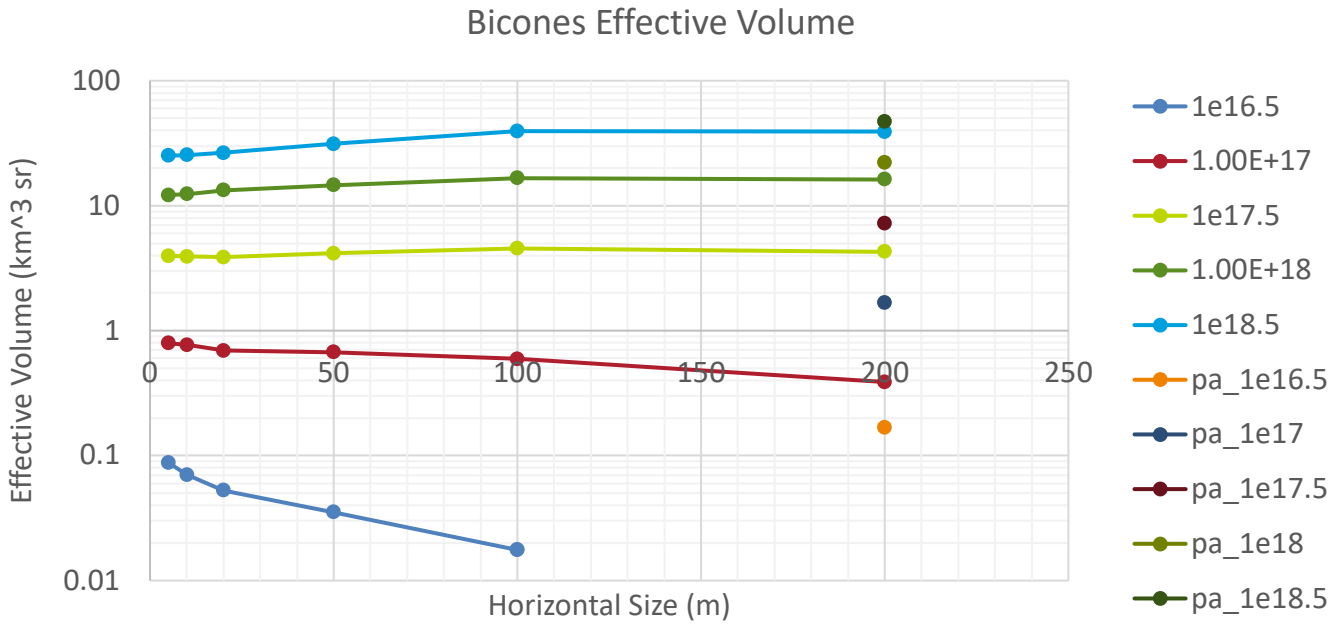




Effective Volumes



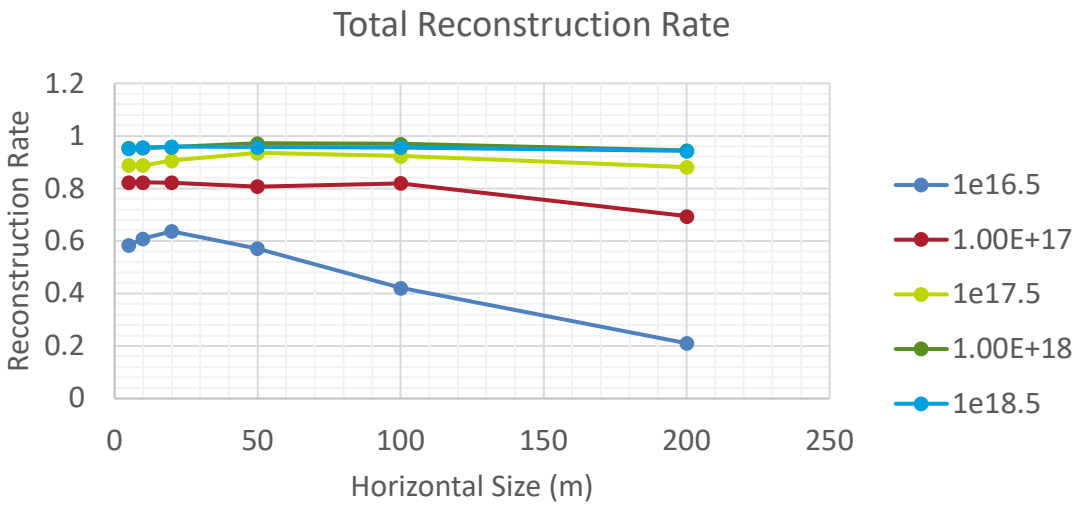
Effective Volumes



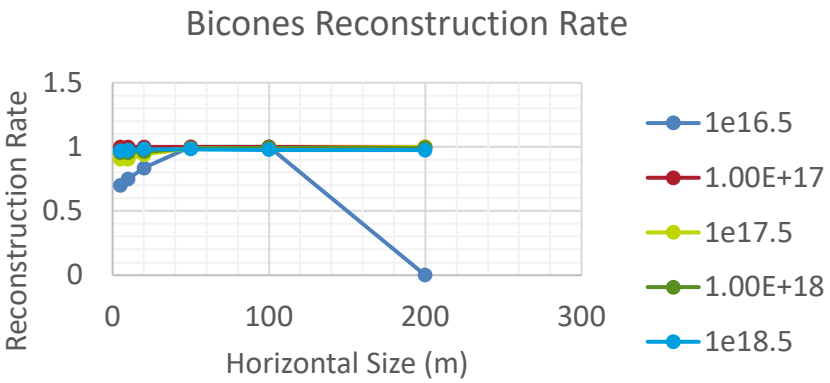
Pseudo Reconstruction Rate

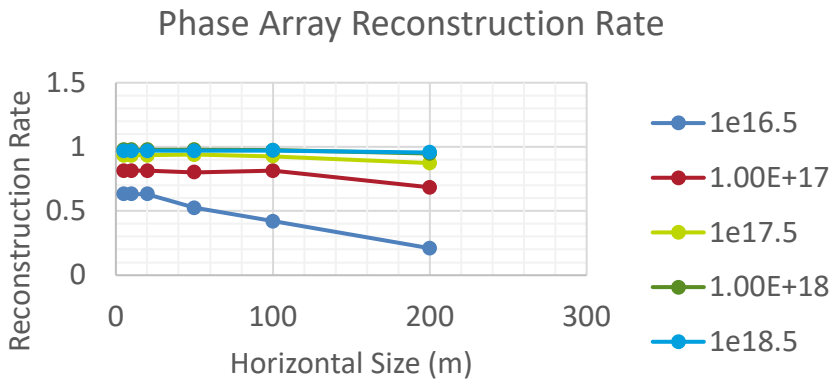
If Σ(Vmax / Vrms)^2 > 90 for peripheral bicones:
This event is reconstructable

Reconstruction rate = Veff reconstructable / Veff

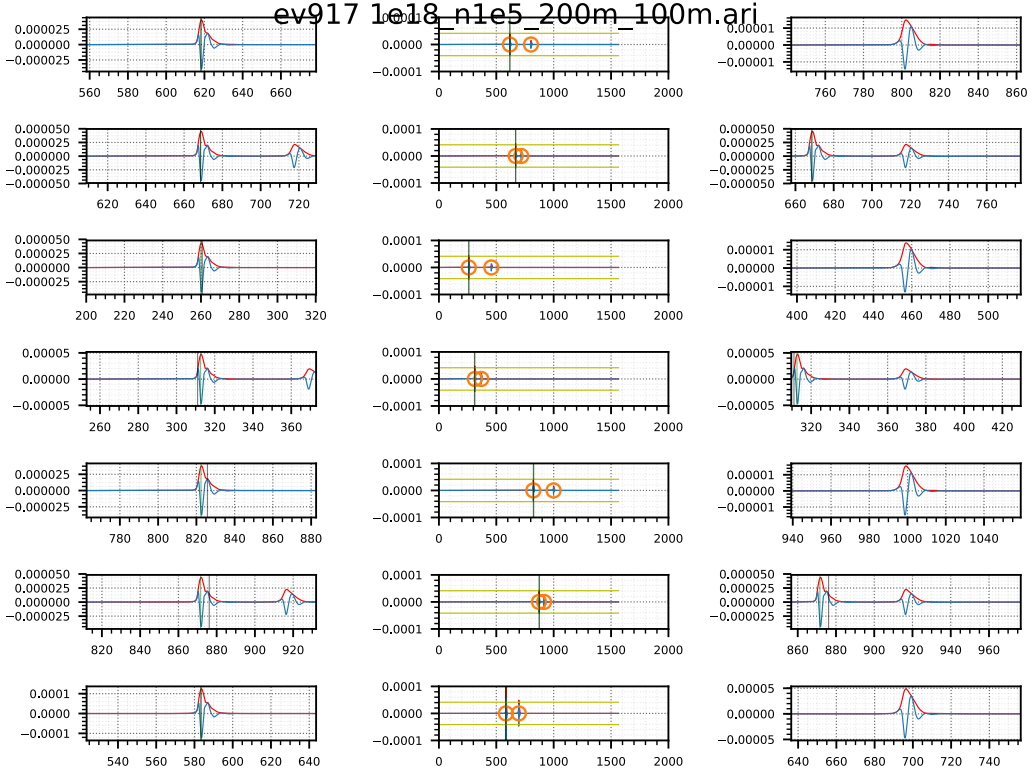


Pseudo Reconstruction Rate



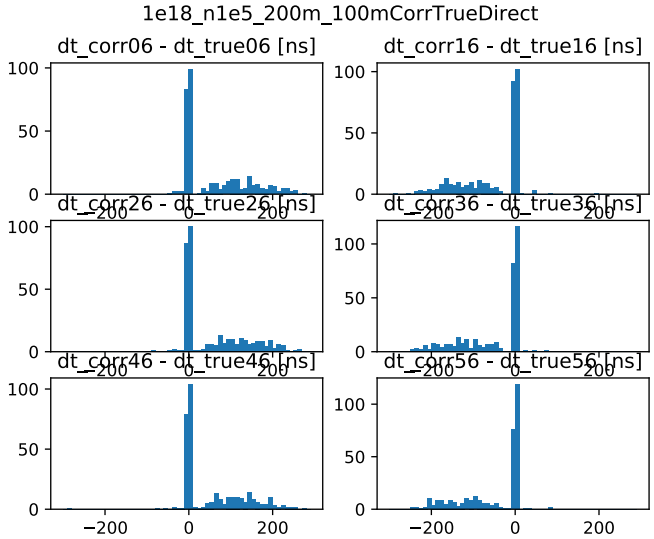


Waveforms



dt06 = 34.8ns
dt16 = 85.2ns
dt26 = -323.4ns
dt36 = -270.8ns
dt46 = 239.0ns
dt56 = 288.2ns
dt66 = 0.0ns

Waveforms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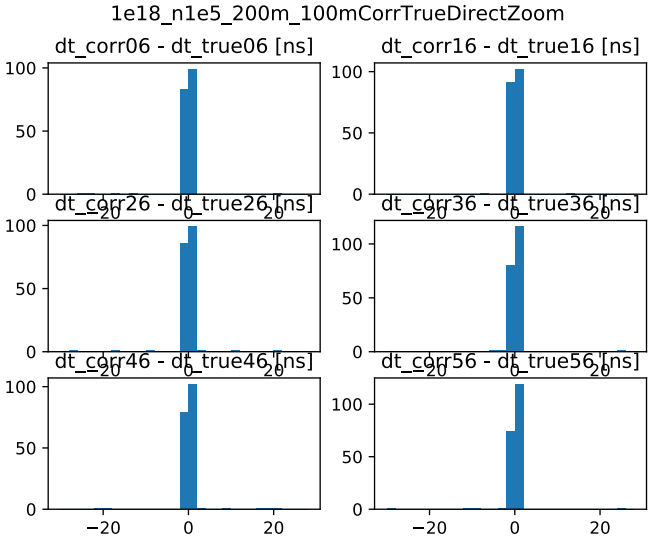
dt_corr06 - dt_true06 [ns]
dt_corr16 - dt_true16 [ns]
dt_corr26 - dt_true26 [ns]
dt_corr36 - dt_true36 [ns]
dt_corr46 - dt_true46 [ns]
dt_corr56 - dt_true56 [ns]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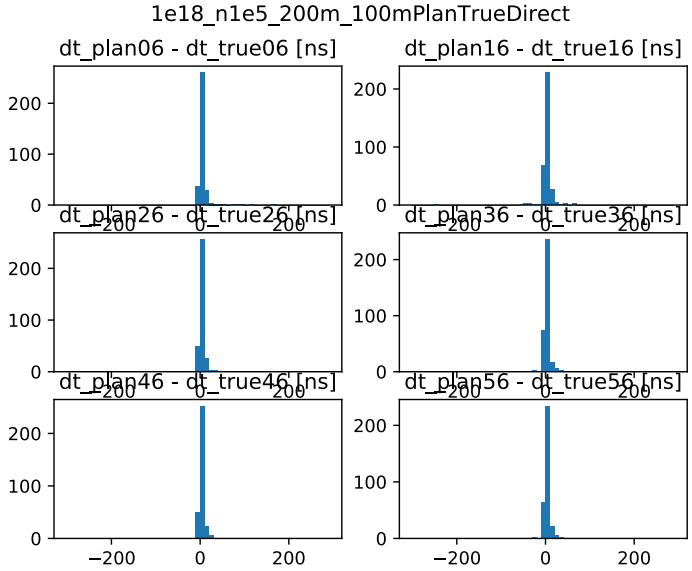
dt_corr06 - dt_true06 [ns]
dt_corr16 - dt_true16 [ns]
dt_corr26 - dt_true26 [ns]
dt_corr36 - dt_true36 [ns]
dt_corr46 - dt_true46 [ns]
dt_corr56 - dt_true56 [ns]

Waveforms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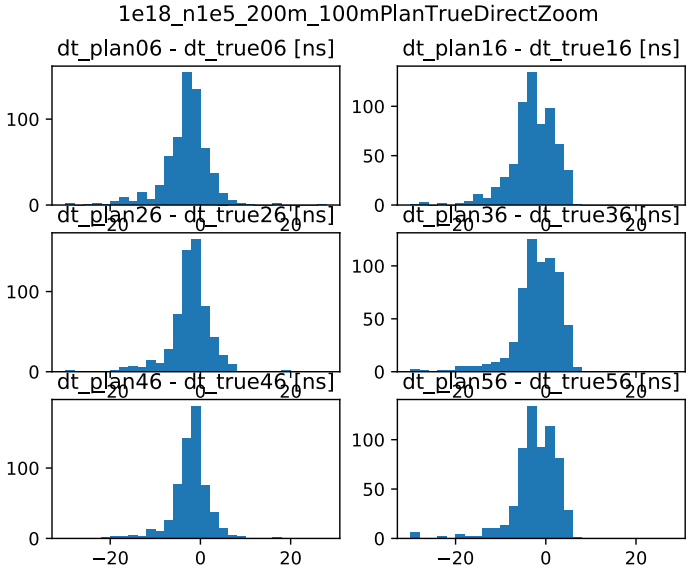
dt_plan16 - dt_true16 [ns]
dt_plan26 - dt_true26 [ns]
dt_plan36 - dt_true36 [ns]
dt_plan46 - dt_true46 [ns]
dt_plan56 - dt_true56 [ns]


1e18_n1e5_200m_100mPlanTrueDirectZoom
dt_plan06 - dt_true06 [ns]
dt_plan16 - dt_true16 [ns]
dt_plan26 - dt_true26 [ns]
dt_plan36 - dt_true36 [ns]
dt_plan46 - dt_true46 [ns]
dt_plan56 - dt_true56 [ns]

Going Forward

- Adding noise
- Doing actual reconstruction

Thank you