

Ferrous Materials: Barite Wall Support Structure

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Updated:

June 4th, 2023

9098 – Barite Wall Supports

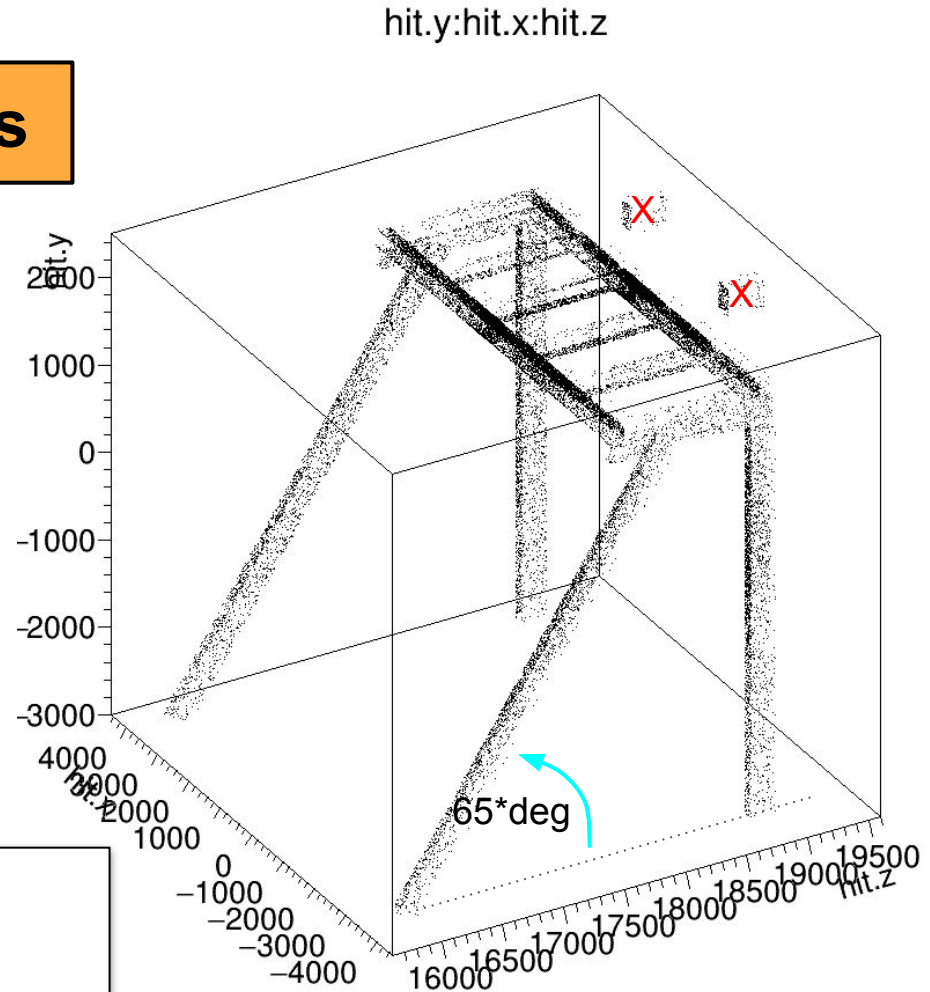
Simulation improvements:

Width of barite wall changed from:

4000mm → 4600mm

Hooks removed from support structure
GDML into their own geometry.

**My best effort at the barite wall.
I-beams are 8"x8"
Steel legs are 8"x8" with 2" walls**



9098 – Barite Wall

Material	X r	Spin Polarization (P f)	Frac e- on Target	Frac of events Per Moller
Mild Steel	2000	1E-02	1E-11	1E-07
Stainless Steel (Worst)	1	1E-05	1E-08	1E-04
Stainless Steel (Ideal)	0.01	1E-07	1E-06	1E-02
Aluminum	0.0001	1E-09	1E-04	1E+00
Inconel 625	0.001	1E-08	1E-05	1E-01
Brass/Bronze (Worst)	0.001	1E-08	1E-05	1E-01

Sens Volume:	Barite Wall Supports
Sim Date:	6/4/2023
Detector #:	9098

Problematic with carbon steel

Barite Wall Supports -- Symmetric Toroid Fields

Total Prim	10,000,000,000	Total Secondary	500,000 (per sens det)
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Primary Counts		
Primaries	0	0&1
9098		25319

Primary Fractional		
Primaries	0	0&1
9098		2.53E-06

(9928 MainDet) Secondary Counts - 0&1		
Secondaries	Electrons	Gammas
9098	232	427

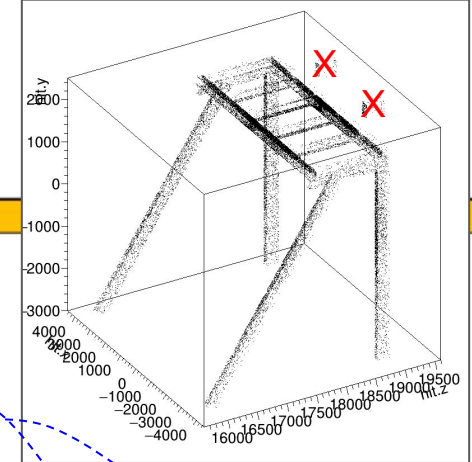
(9928 MainDet) Secondary Fractional - 0&1		
Secondaries	Electrons	Gammas
9098	4.64E-04	8.54E-04

(9928 MainDet) Total Fractional - 0&1		
Secondaries	Electrons	Gammas
9098	1.17E-09	2.16E-09

(9911 MainDet) Secondary Counts - 0&1		
Secondaries	Electrons	Gammas
9098	1058	1617

(9911 PMT Region) Secondary Fractional - 0&1		
Secondaries	Electrons	Gammas
9098	2.12E-03	3.23E-03

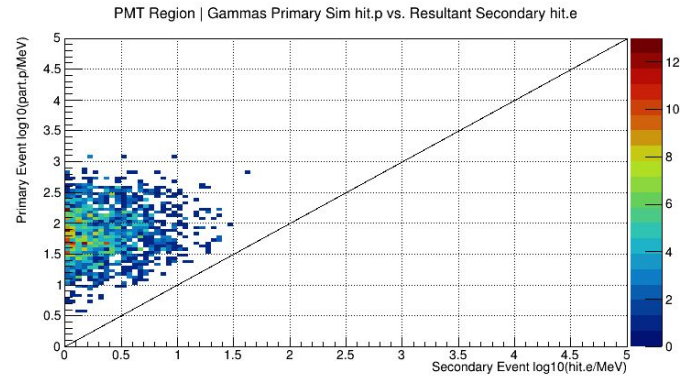
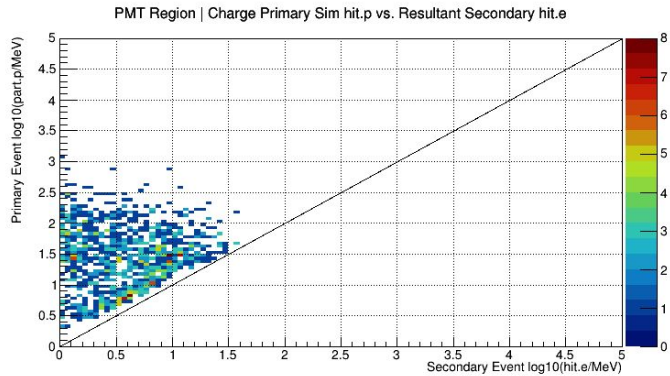
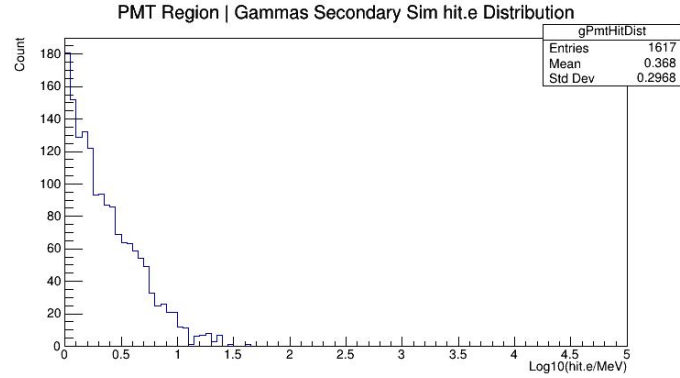
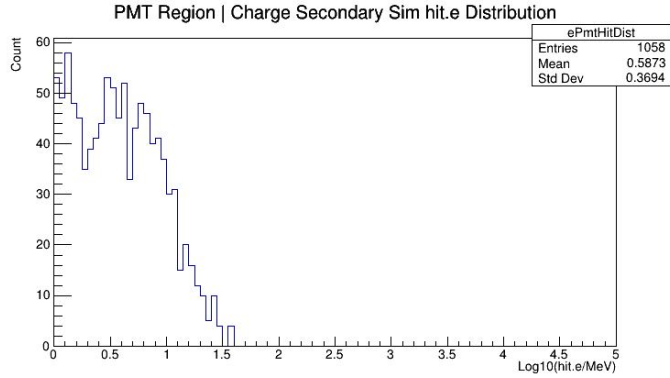
(9911 PMT Region) Total Fractional - 0&1		
Secondaries	Electrons	Gammas
9098	5.36E-09	8.19E-09



Probably should have run more secondaries...

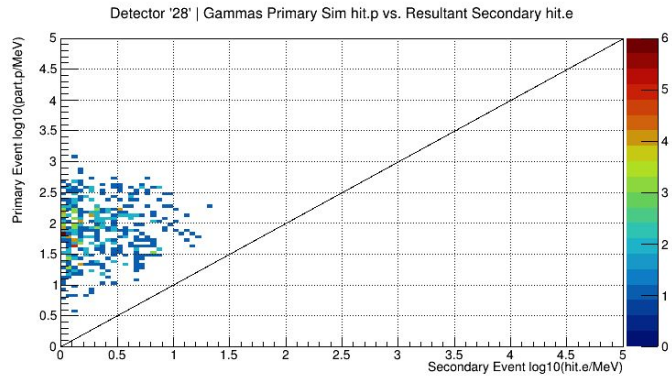
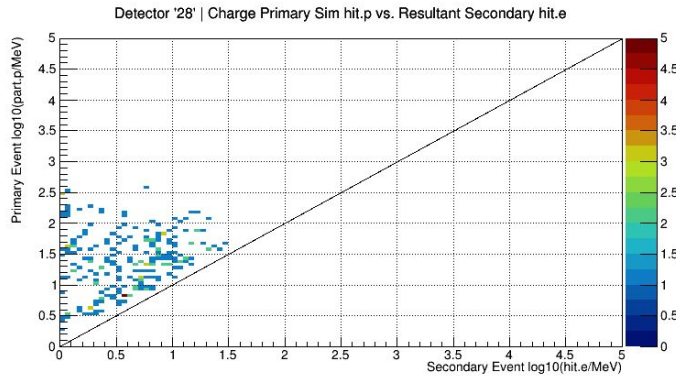
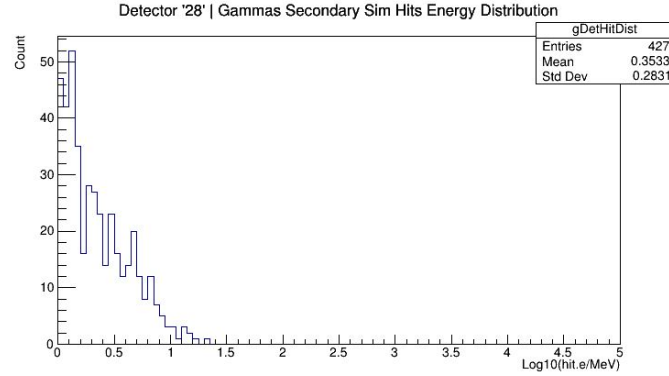
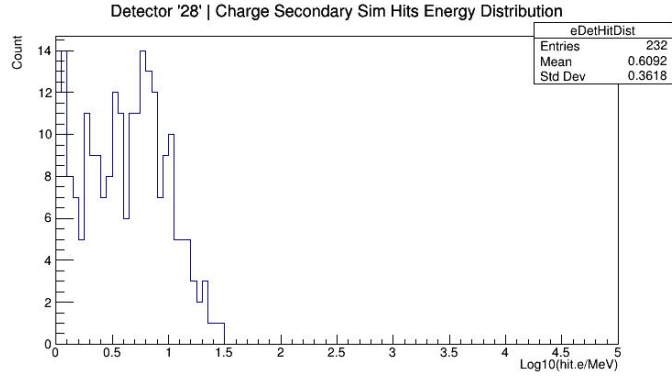
9098 – Barite Wall

Secondary Hits vs. “Primary” vertex



9098 – Barite Wall

Secondary Hits vs. “Primary” vertex



Conclusion

- Widening of the wall provide a small reduction in the ferrous backgrounds but nowhere near sufficiently enough to justify a carbon-steel structure.
- Even with taking into consideration our very conservative estimates for ferrous background calculations these are borderline.