New Liquid Argon Light Maps and Simulation for Three Rayleigh Length

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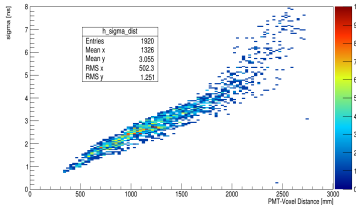
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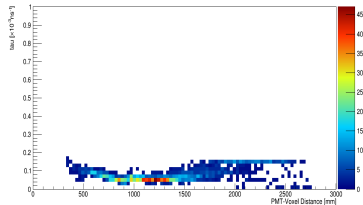# Contents

Parameters vs Dist for $L_{Ray} = 20\,cm$
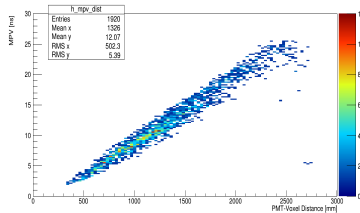
Sigma Tau

MPV

Fits seem to went well for 20cm and also for the others

2D view of Visibility for PMT 3
20cm

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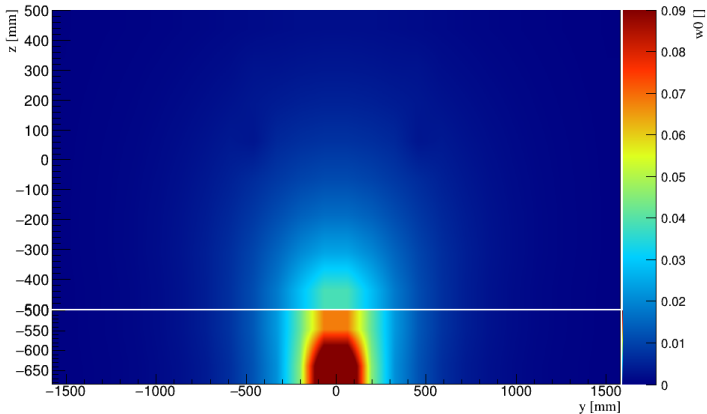
2D view of Visibility for PMT 3
55cm

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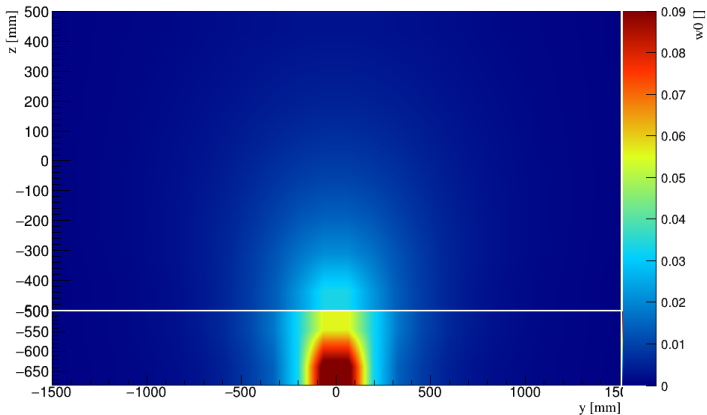
2D view of Visibility for PMT 3
163cm
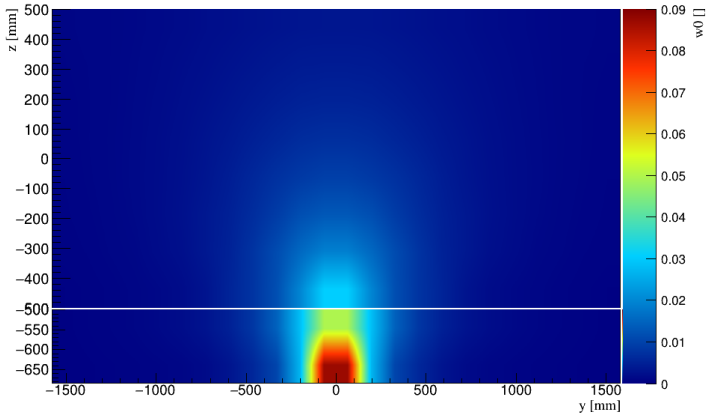
Decreasing of visibility with increasing of Rayleigh length

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Visibility vs Distance to PMT
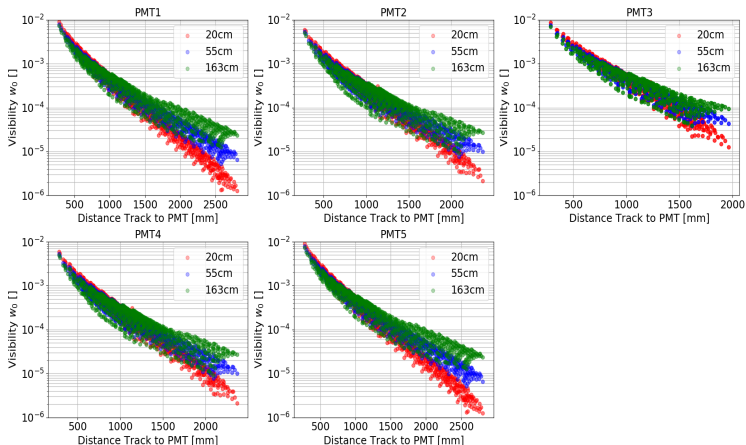
Visibility decrease with the increasing of Rayleigh length at short distance but increase at high distance

Simulation Parameters

- ▶ 5000 muons
- ▶ Rayleigh length : 20cm ; 55cm ; 163cm
- ▶ No Electric Drift Field (except one simulation at 500V)
- ▶ Charge obtained by integrating over $4\mu s$
- ▶ Event taken only if closest point Track-PMT is above the cathode

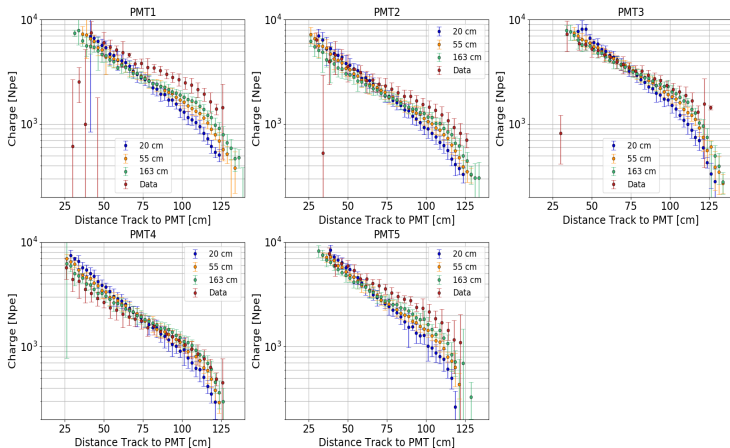# Charge vs PMT to Track distance

Without Data
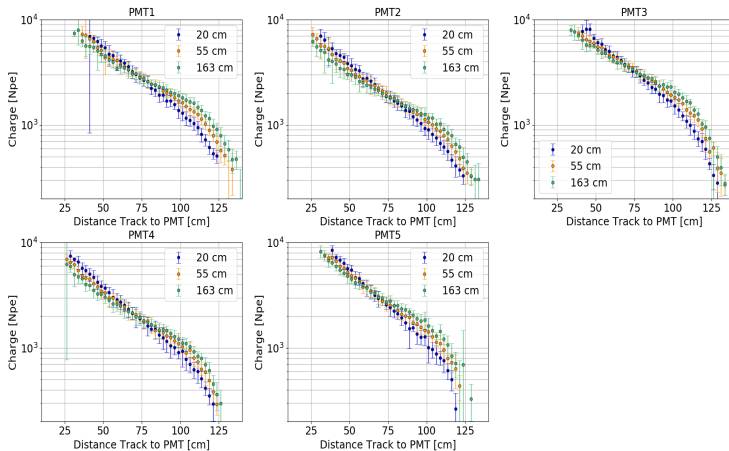
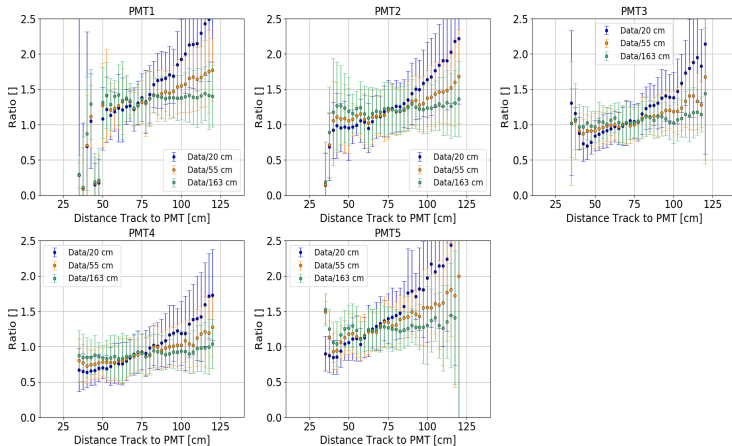
Difference between the three Rayleigh lengths not so big

Charge vs PMT to Track distance
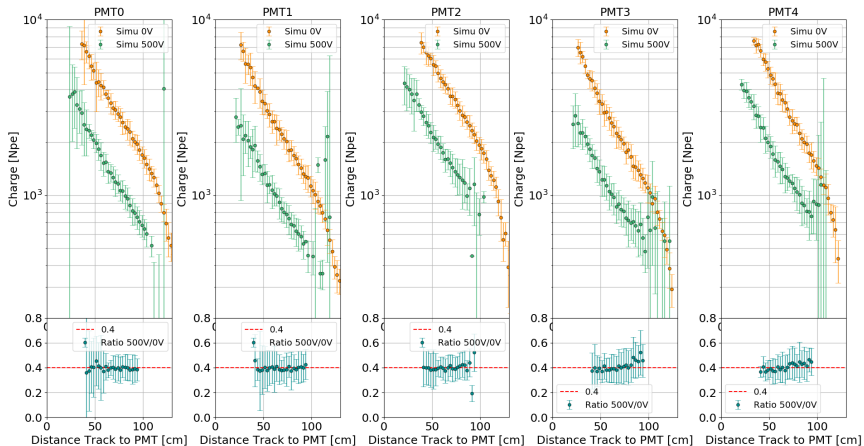## With Data

Hard to tell the agreement with data

Ratio Data/MC

Streghten the fact that we cannot tell wich L_{Rays} is in agreement with data.

Simulation at 500V

For Simulation, the recombinaison factor is found around 0.4, in agreement with Icarus

Conclusion

- Fit with the Landau went well for all L_{Ray}
- Visibility seems to decrease when the Rayleigh length increase at short distance ($< 1000mm$) and the other way around at higher distance ($< 1000mm$)
- The difference between the different length scattering is not enough to allow us to conclude when comparing with data
- Probably not useful to do the 90cm map
- Recombinaison factor with simulation is in agreement with Icarus.