

# The EMCal of the ZDC

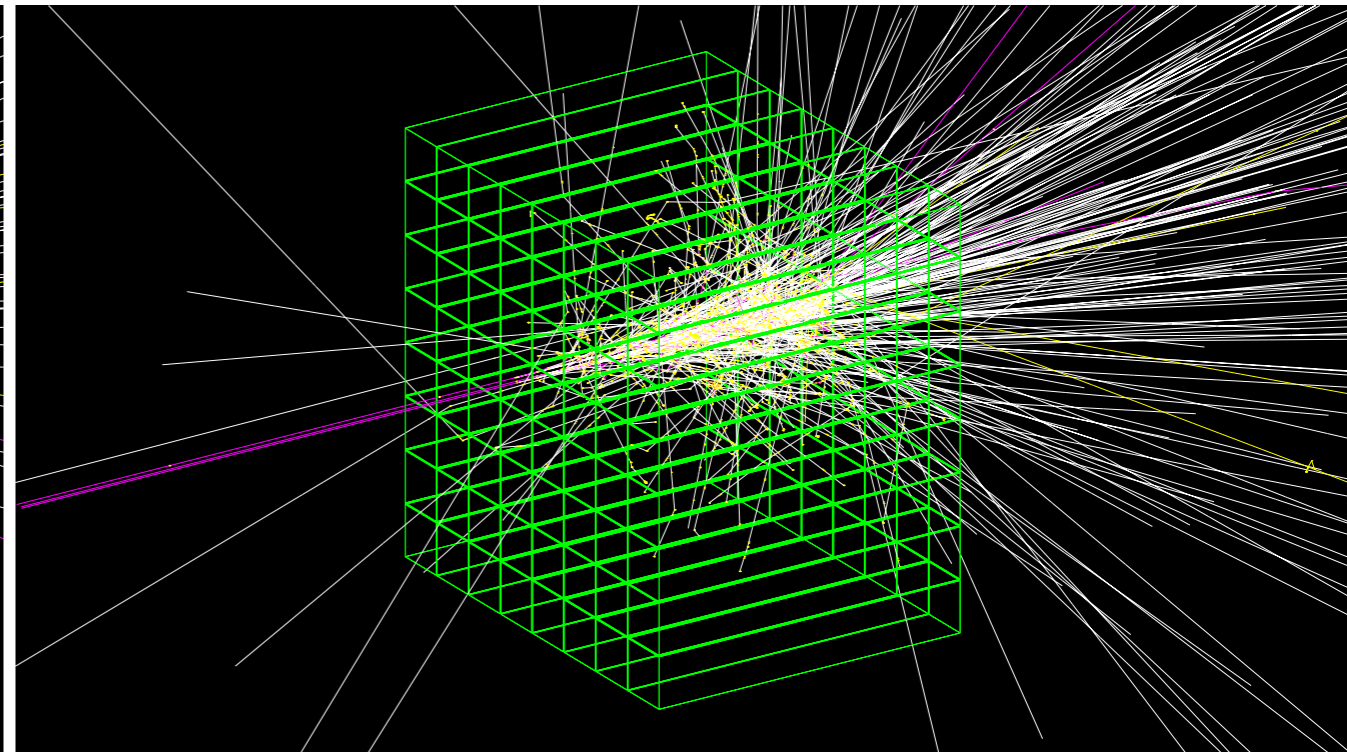
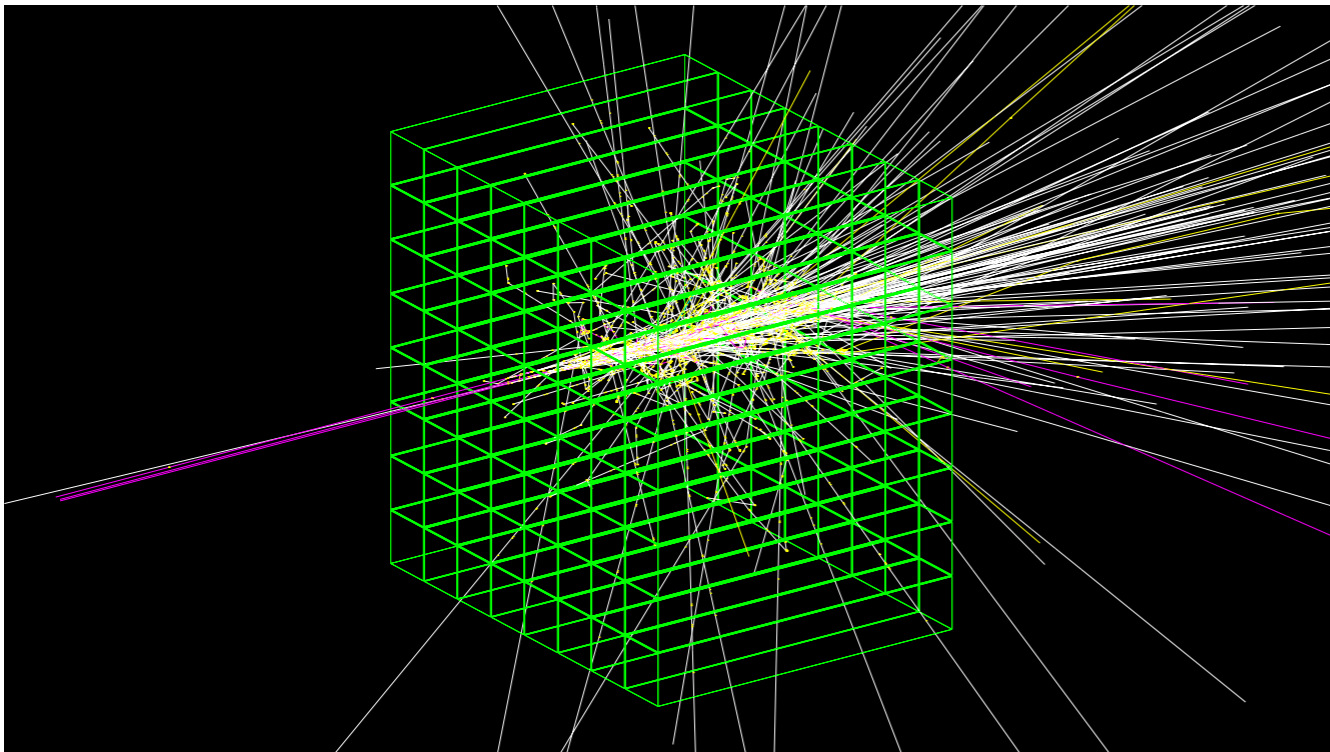
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# Event displays

LYSO

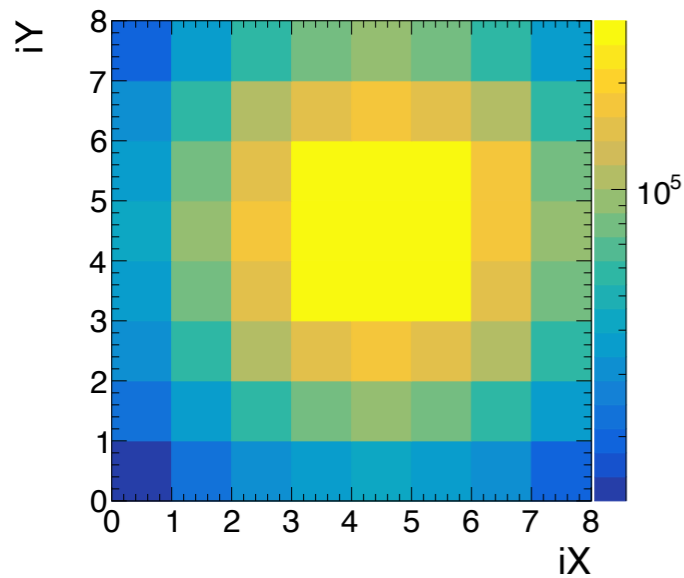
PbWO<sub>4</sub>



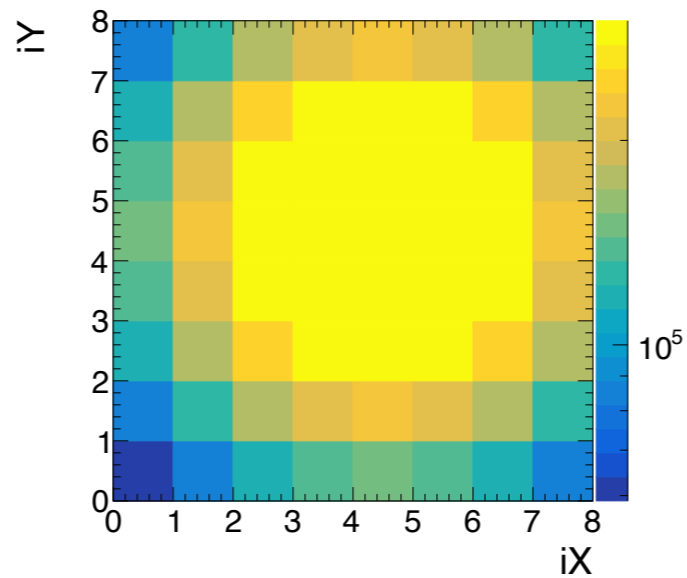
- Crystal dimension (front face): 7mm x 7mm

# Energy distribution

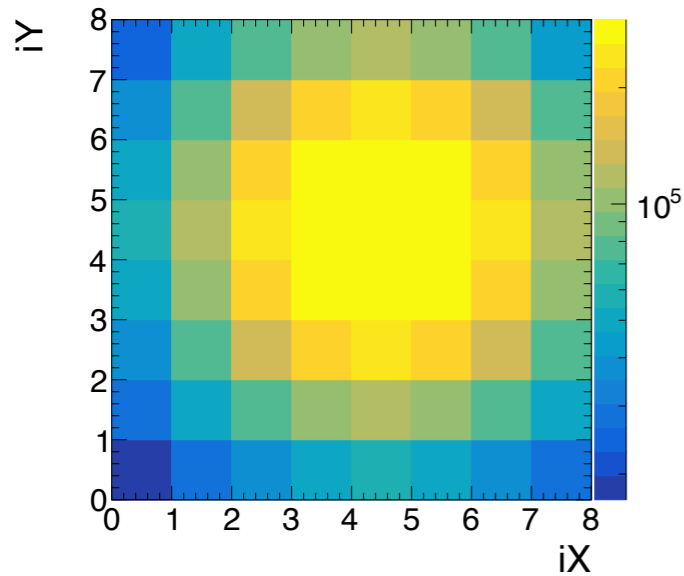
Energy spread (LYSO 44mm)



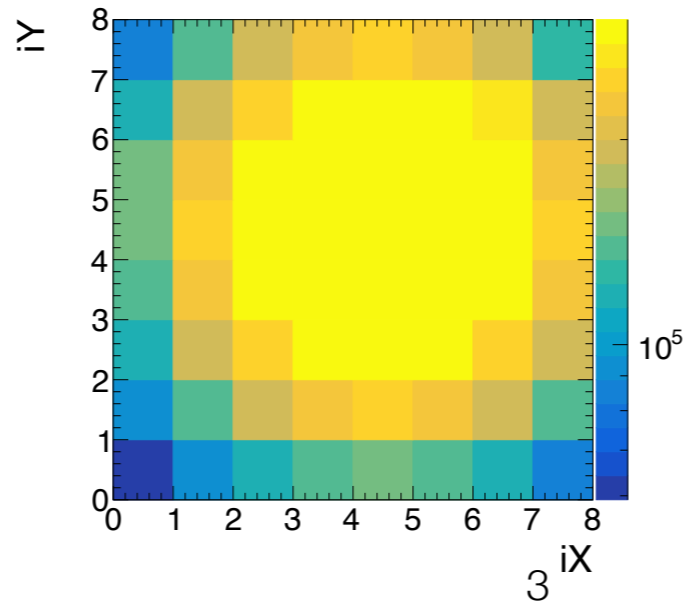
Energy spread (LYSO 88mm)



Energy spread (PbWO<sub>4</sub> 44mm)

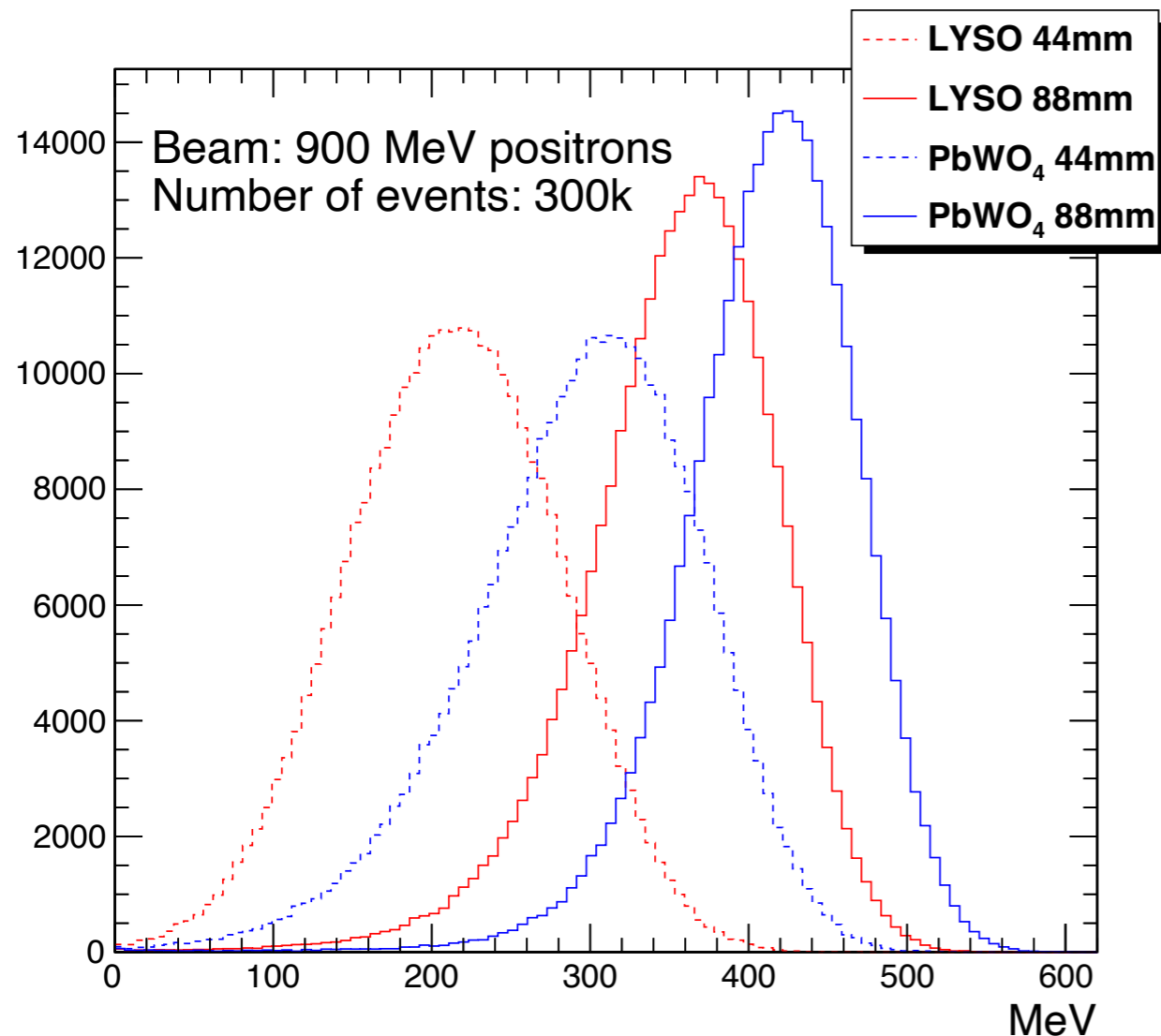


Energy spread (PbWO<sub>4</sub> 88mm)



- LYSO vs PbWO<sub>4</sub>
- Length: 44mm vs 88mm

# Energy deposit in the central crystal

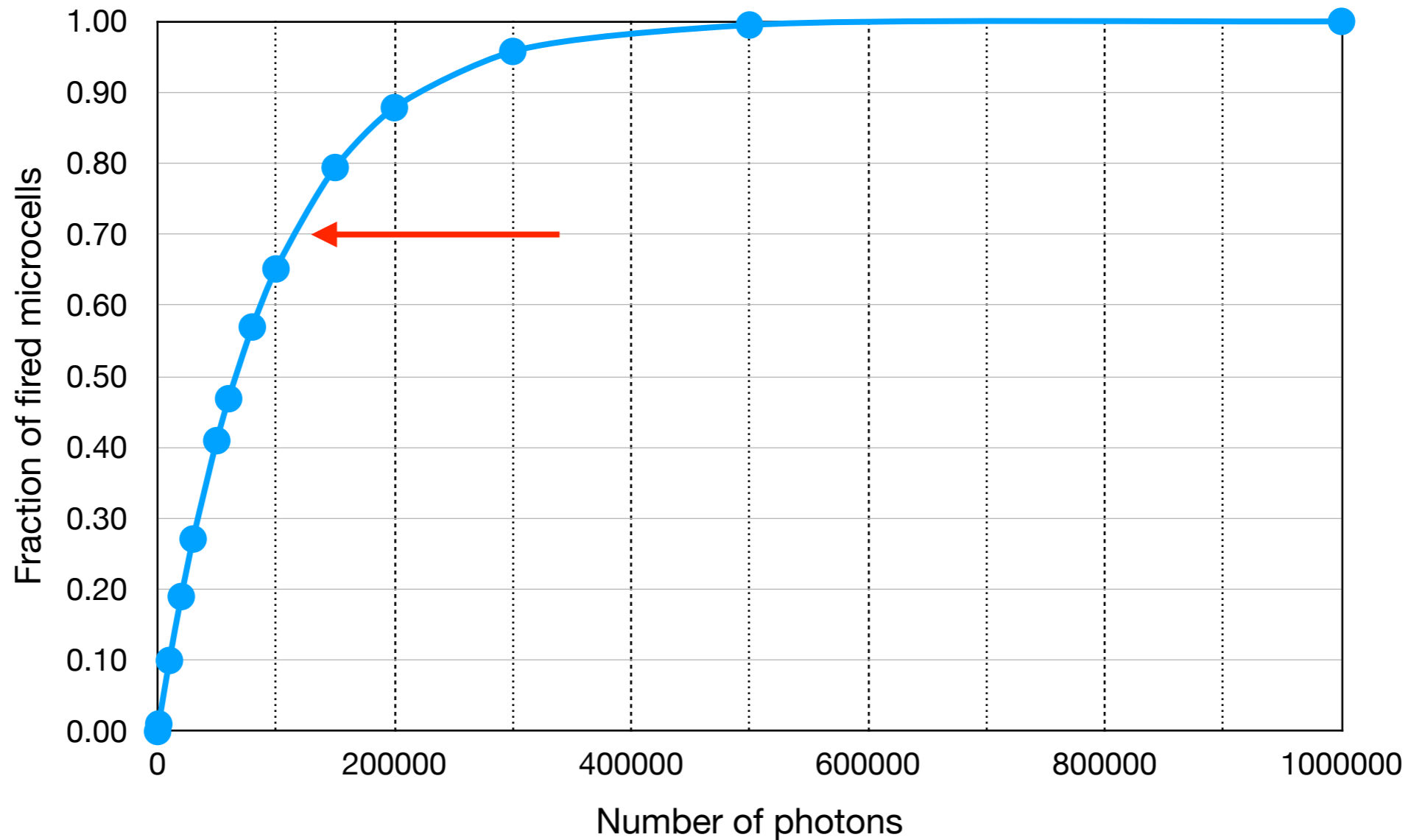


- Not really a fair comparison because PbWO<sub>4</sub> has a shorter radiation length
- Simulation needs to be redone with the exact  $1X_0$  for PbWO<sub>4</sub>

# Light yields

- assuming light collection efficiency: 25% and photon detection efficiency: 20%
- length of crystal: 88mm
- LYSO:  $500\text{MeV} \times 40000 \text{ photons/MeV} \times 0.2 \times 0.25$   
= 1,000,000 photons
- $\text{PbWO}_4$ :  $500\text{MeV} \times 200 \text{ photons/MeV} \times 0.2 \times 0.25$   
= 5000 photons

# Fired microcells vs # of photons



- Need the fraction of fired microcells of a SiPM below 70% for a linear response