Vertical drift electron shower simulation

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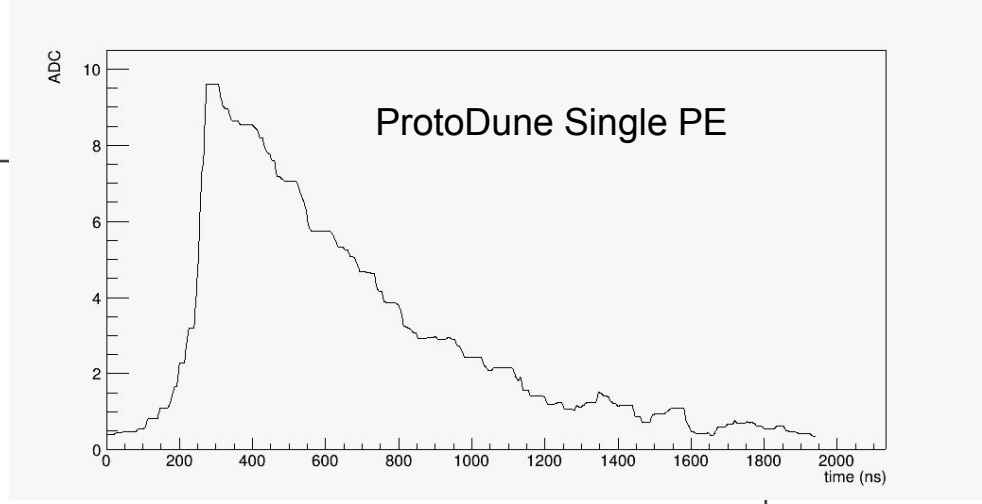
Vertical drift electron shower simulation

- 6 GeV e- shower @ 0.5m from cathode
- Pure LAr, $\lambda_{Rayleigh}$ = 99.9cm, $\lambda_{absorption}$ = 50m
- Time intervals taken into account
  - Scintillation time profile emission
  - Photons propagation across cryostat volume
  - Wavelength shifters absorption-emission at tiles accept. window
- Single PE waveforms models

Cathode transparency = 100%

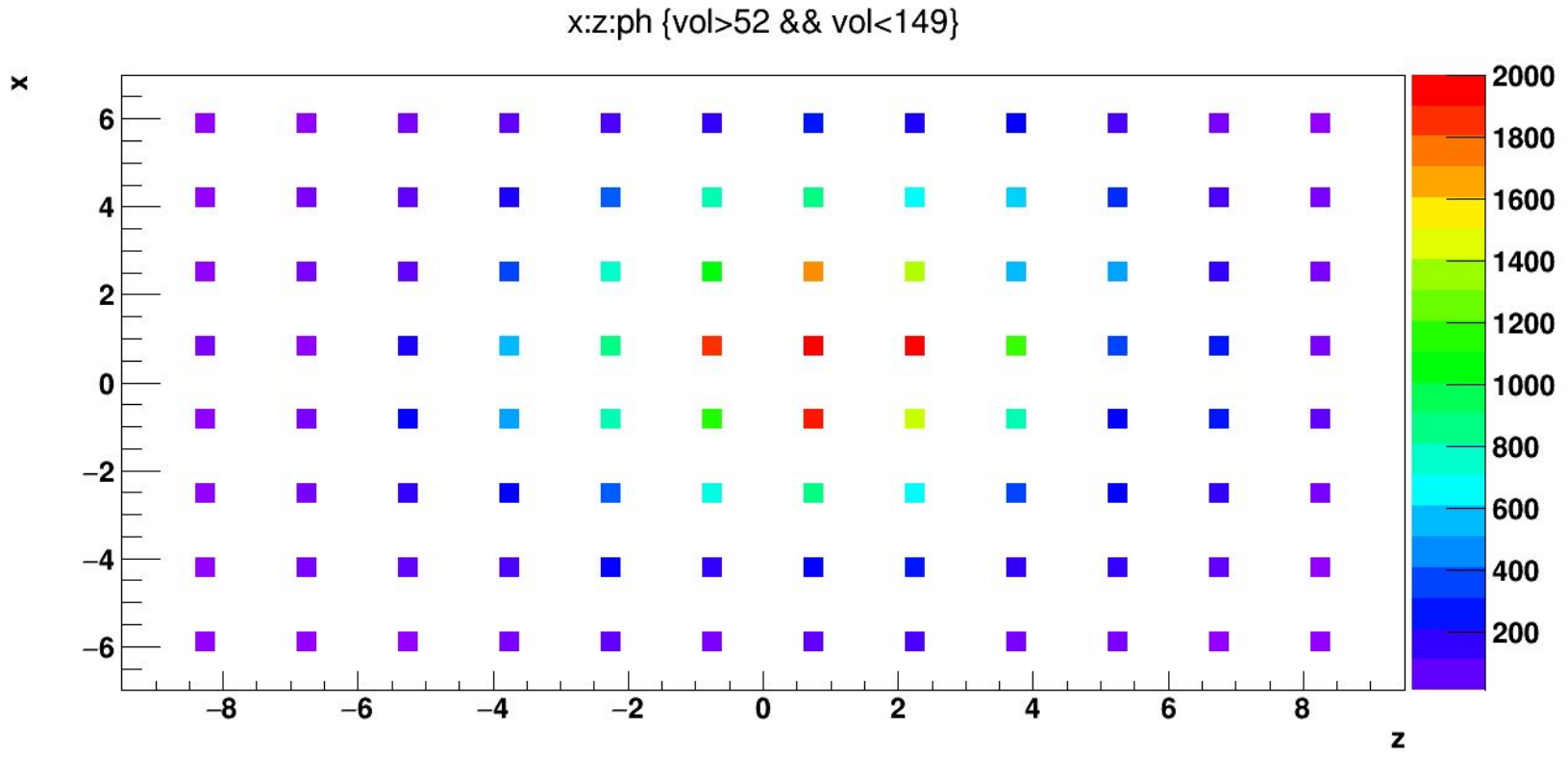


Cathode transparency = 100%

If cathode transparency = 80% → 1 saturated tile (max = 2.5 k)

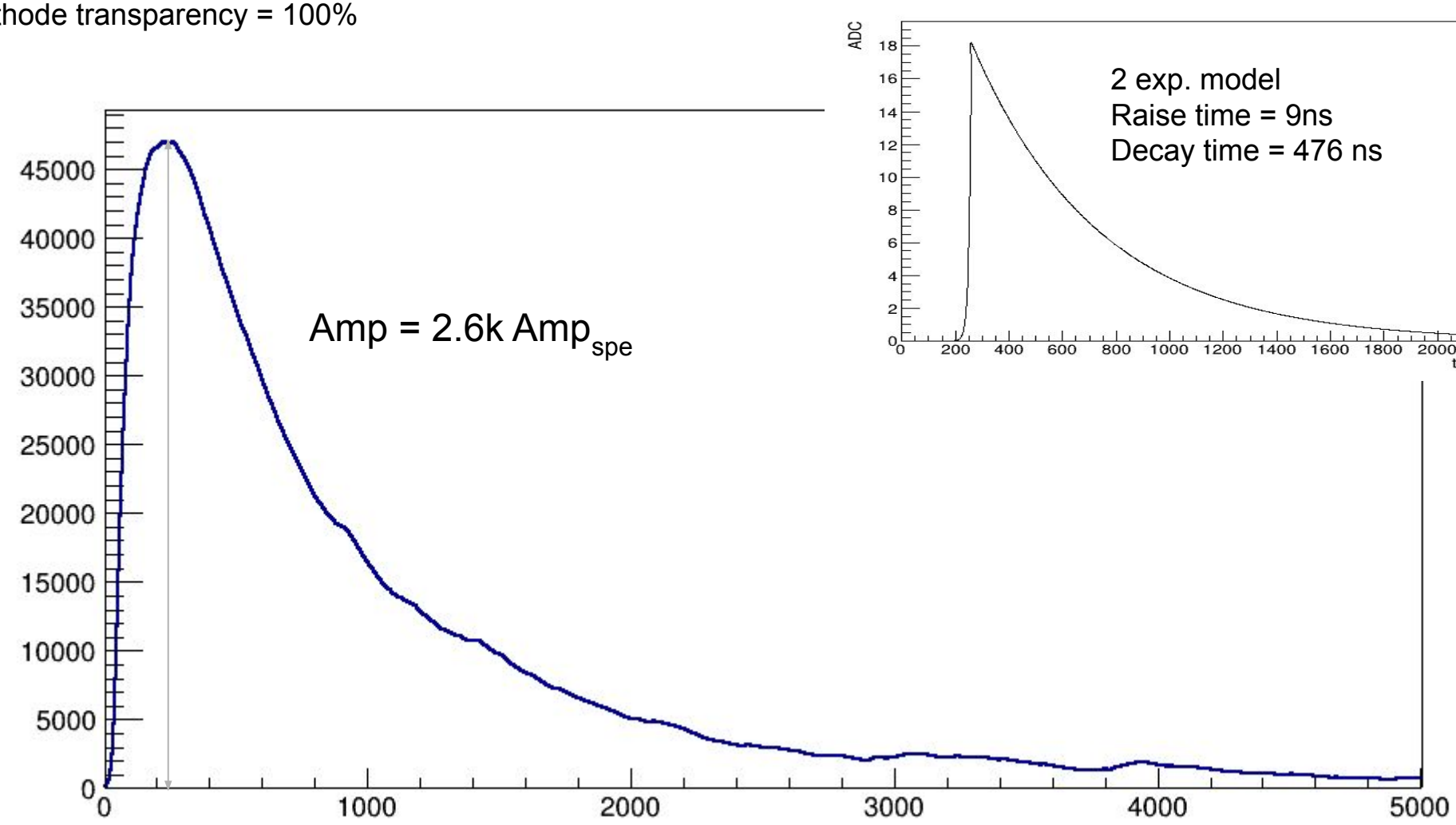
PE Map

Saturated modules over cathode in red. No saturated modules on the laterals



2 saturated tiles

Cathode transparency = 100%



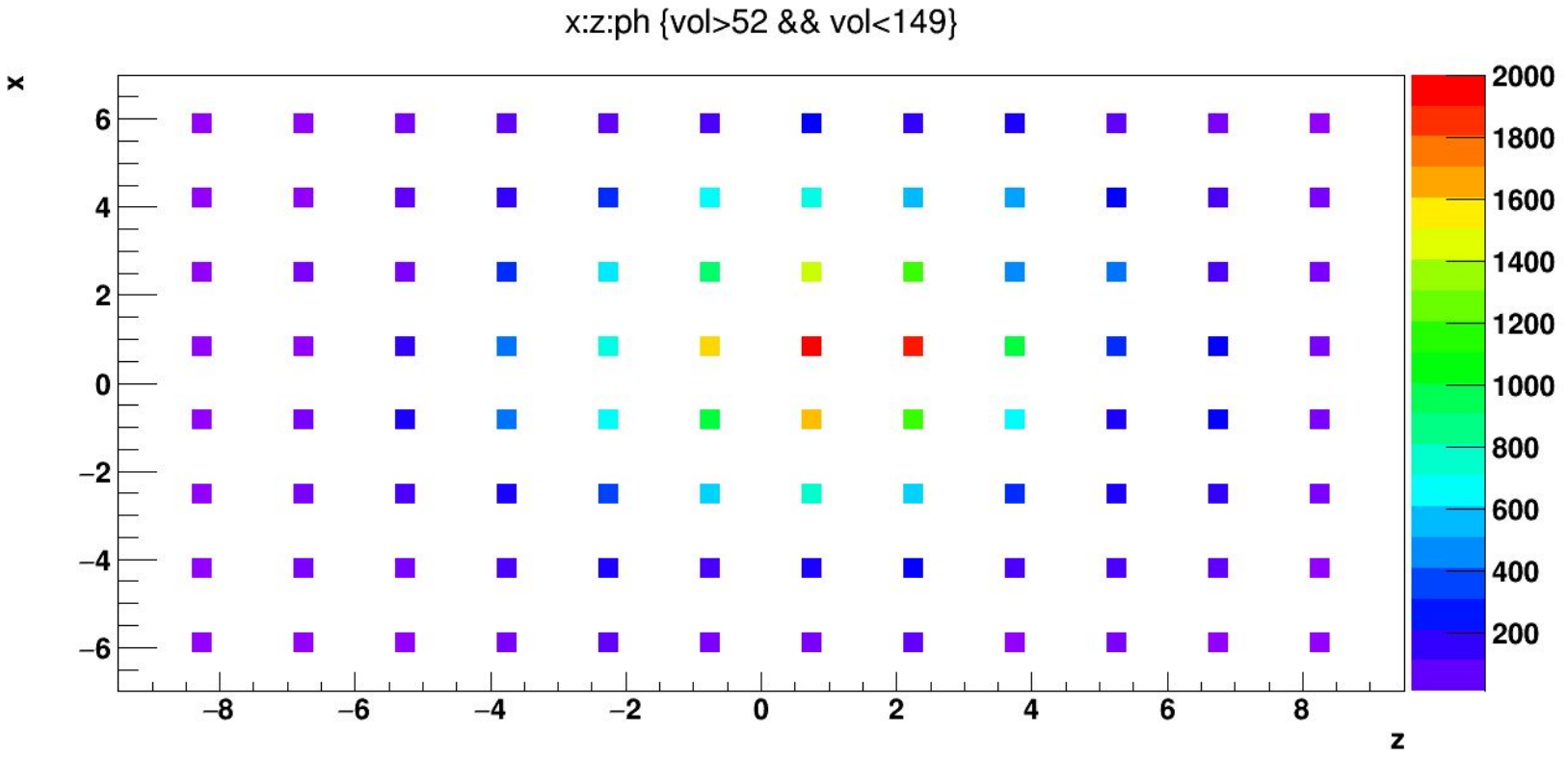
2 exp. model
Raise time = 9ns
Decay time = 476 ns

Cathode transparency = 100%

If cathode transparency = 80% → 1 saturated tile (max = 2.1 k)

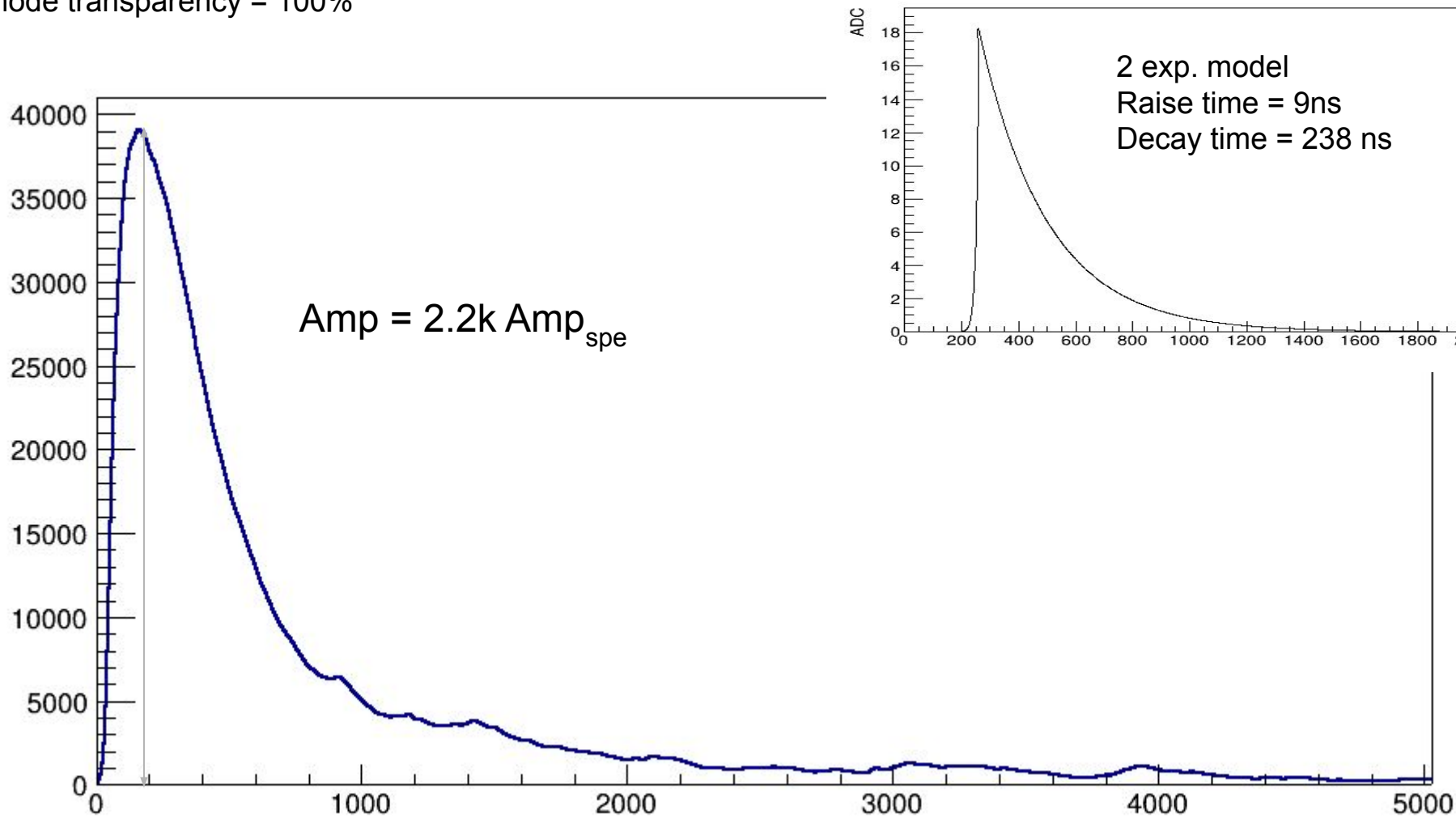
PE Map

Saturated modules over cathode in red. No saturated modules on the laterals



1 saturated tile

Cathode transparency = 100%

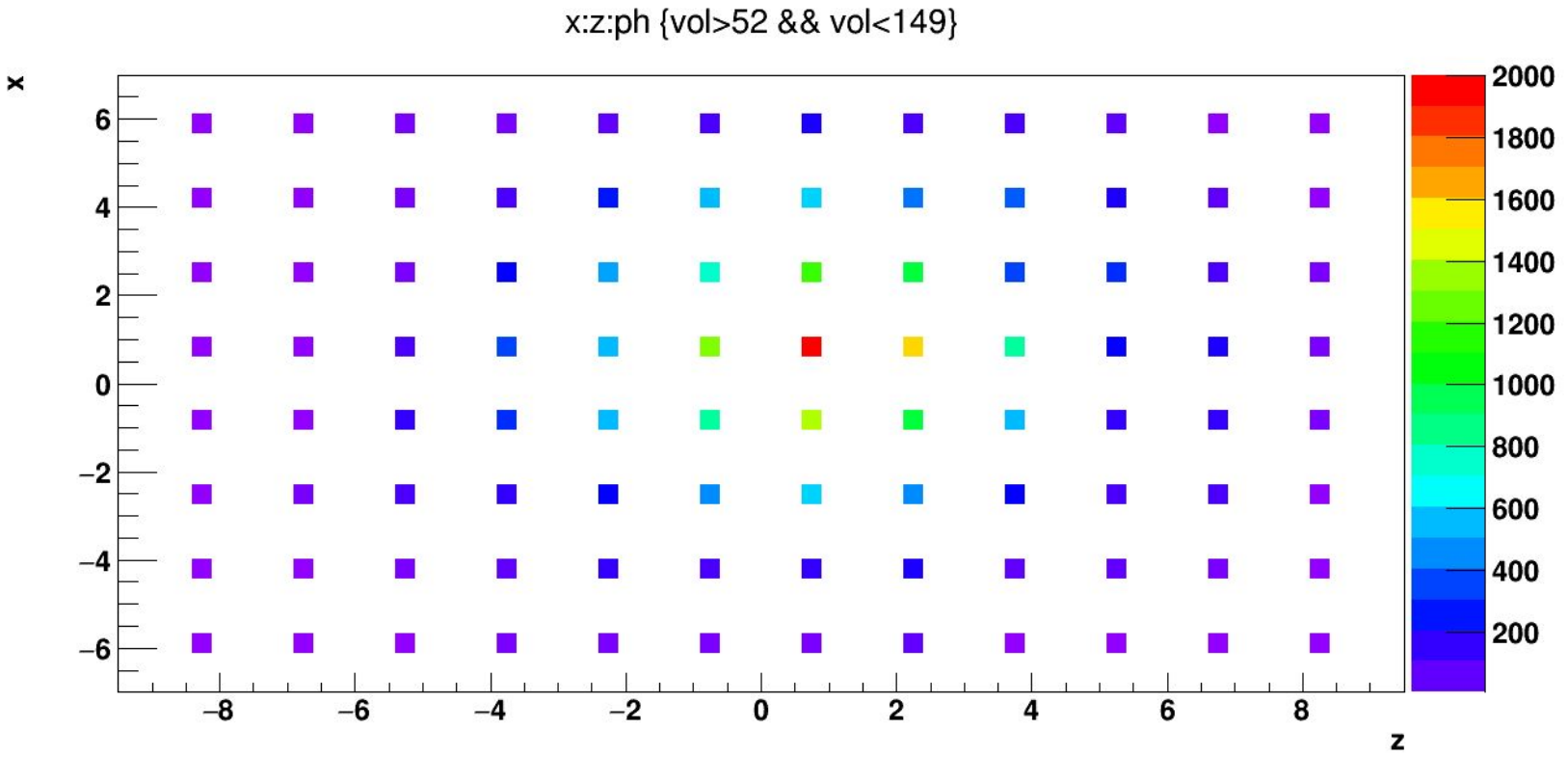


Cathode transparency = 100%

If cathode transparency = 80% → no saturated tiles

PE Map

Saturated modules over cathode in red. No saturated modules on the laterals



1 saturated tile

Summary

- From scintillation to readout data chain is complete
- 6 GeV shower points roughly to dynamical range scale
- Distance scan with point like source
- Energy dependence easier to scale with simpler geometrical factor