

EPICAL-2 Meeting - 09.01.25

Lateral Profiles & FWHM

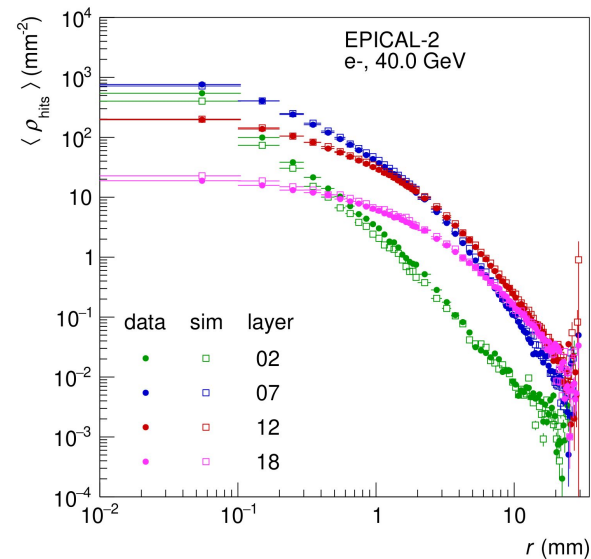
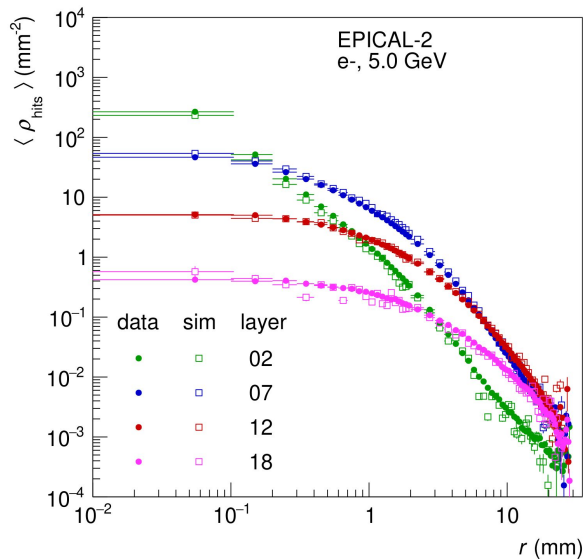
Jan Schöngarth

Chapter 5.1 Lateral Shower Shape

- Figure 9: lateral profiles
- Figure 10: FWHM
- Figure 11: Parametrizations of lateral profiles

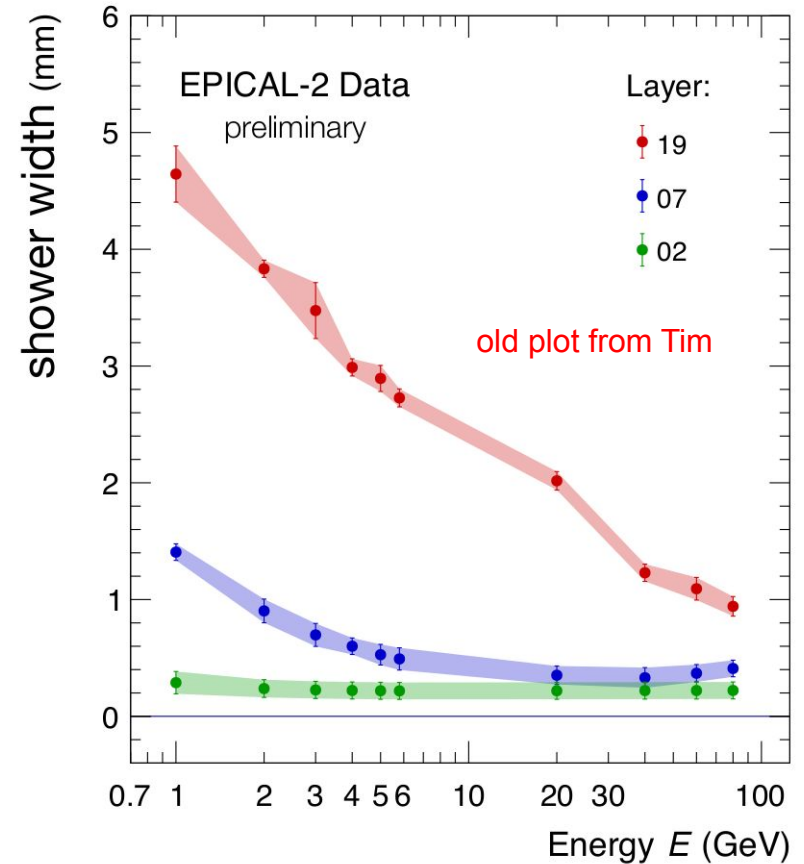
Lateral Profiles

- updated plots with current simulation with energy spread
- simulation with more statistics available?
- SPS event selection: currently 5σ + shower shape cuts
- only 5σ selection for paper
- fluctuations at large radii
- cut at $r = 30$ mm for plotting



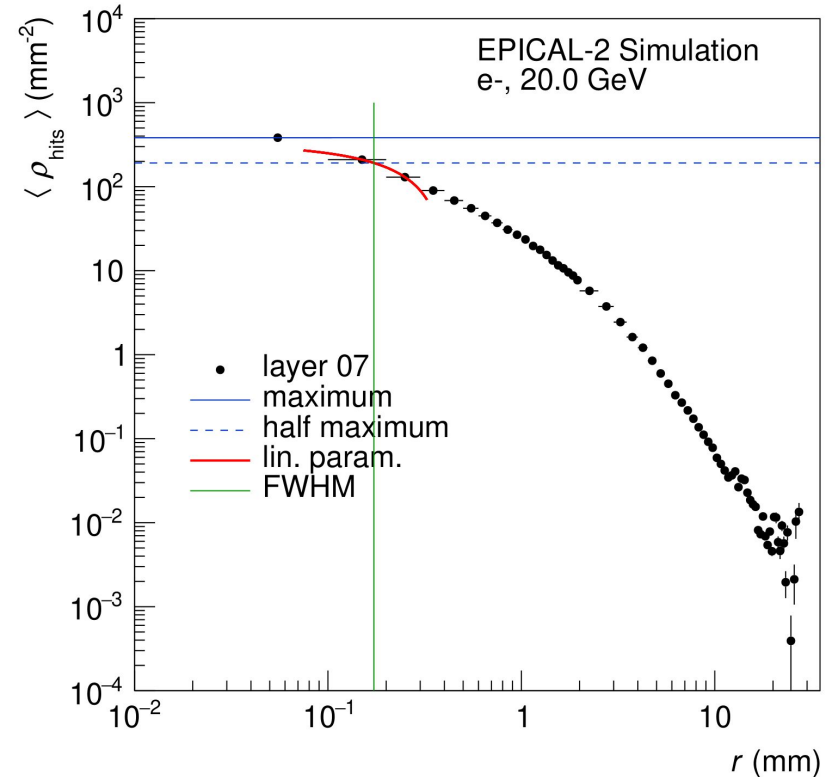
FWHM

- analysis by Tim
- current status: reproducing result



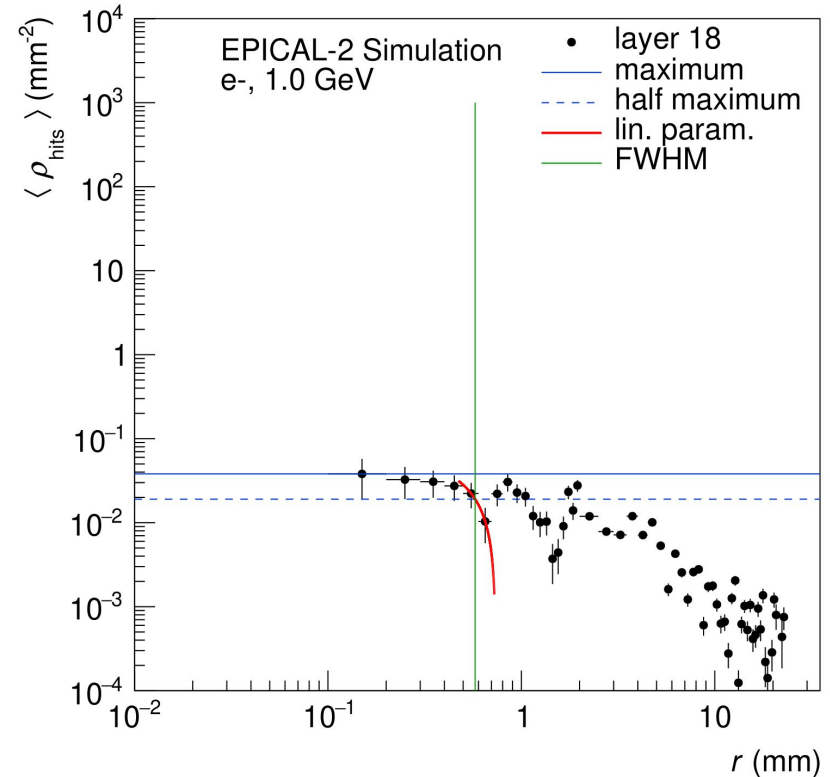
FWHM

1. find maximum y_{\max}
 2. find half maximum $y_{1/2}$
 3. find last bin above $y_{1/2}$
 4. linear fit between that bin and the next bin
 5. get x-value corresponding to $y_{1/2}$ from linear fit
- works well for most energies and layers



FWHM

- problem in deep layers at low energies
- low densities \rightarrow fluctuations
- half maximum line crossed multiple times
- maximum not guaranteed to be at smallest radius
- linear fit method unstable due to fluctuations

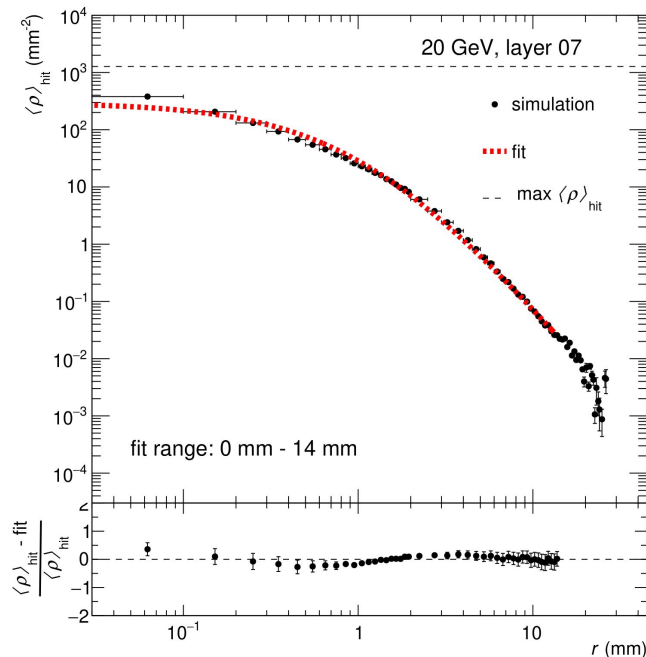
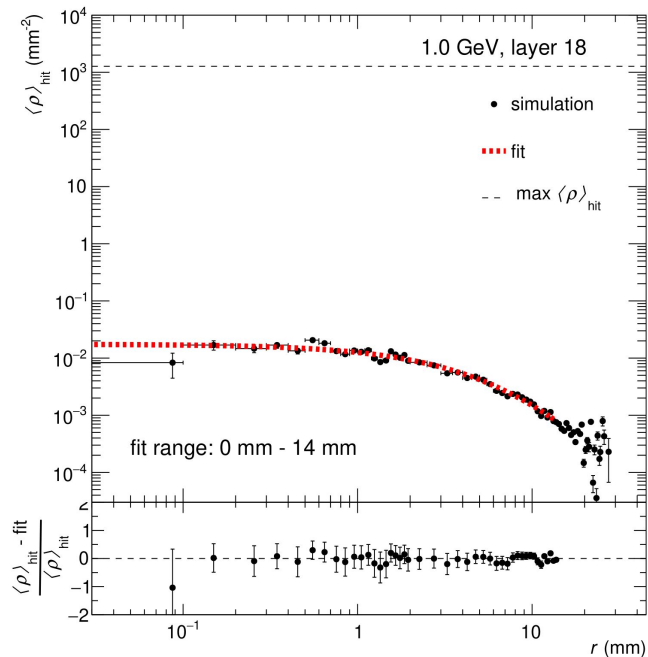


Alternative FWHM

old plots, different simulation

- use parametrization of lateral profiles

→ get FWHM from fit



Chapter 5.1 Lateral Shower Shape

- Figure 9: lateral profiles
- Figure 11: Parametrizations of lateral profiles
- Figure 10: FWHM with fit method?

Conclusion

- lateral profile plots ready to be finalized
- FWHM plot in progress
 - which method in paper?
- lateral profile fits to be remade
 - QA plots for paper? eg. χ^2 distribution