

HIDRA PERFORMANCE ON ELECTRONS

22 Jun 2022

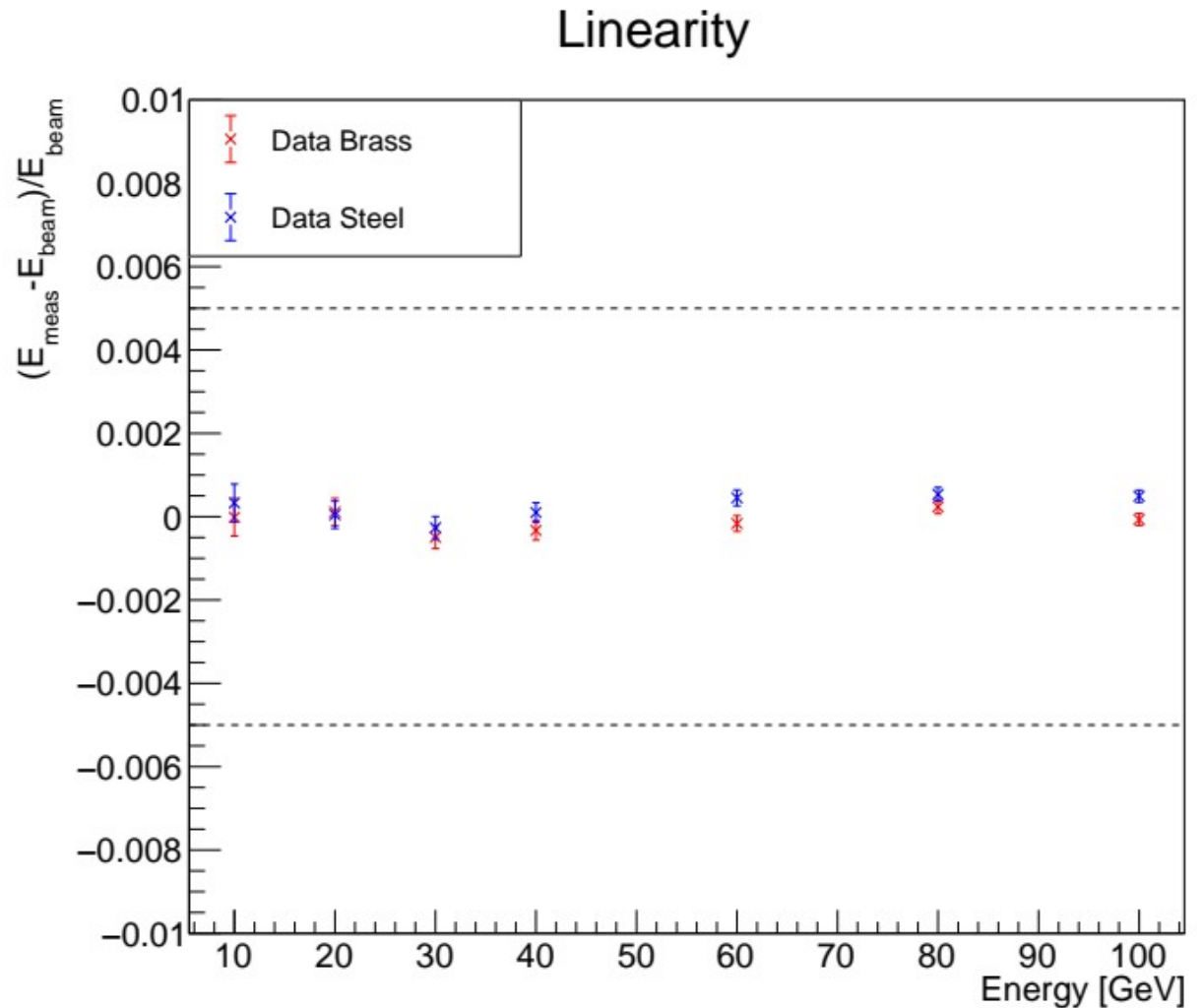
SIMULATION SETUP

- **Brass and Steel passive materials**
- **Beam inclined by 2.5 degrees in X/Y**
- **Shower barycenter in (0, 0), beam diameter ~1cm**
- **10k events**
- **Datasets: 10, 20, 30, 40, 60, 80, 100 GeV**

ELECTRON CALIBRATION

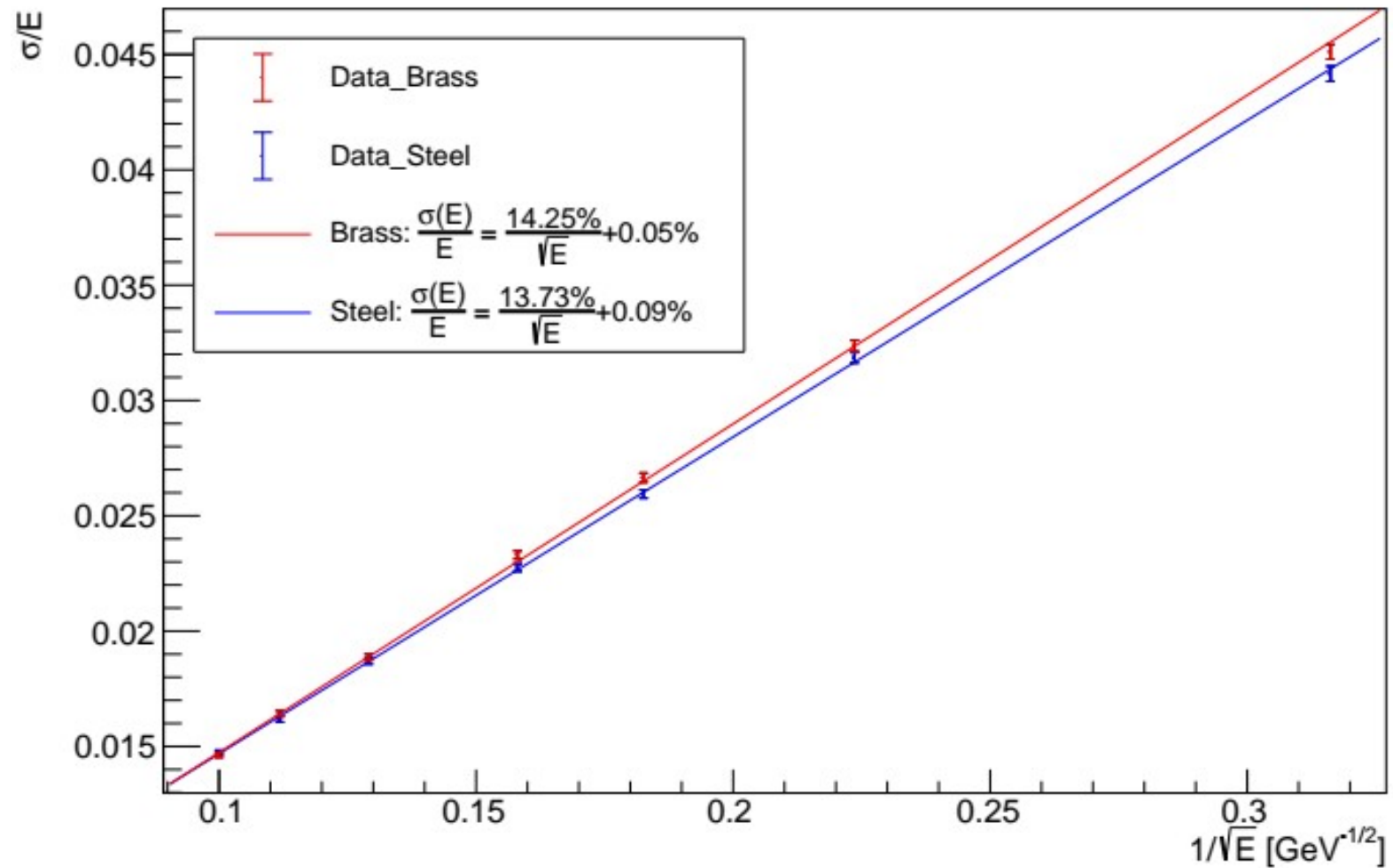
For each material, calculate phe/GeV for both Scintillation and Cherenkov processes

- Sum total E in all modules
- Sum PhotoElectrons in all towers, Scintillator and Cherenkov, separately
- Sum quantities over all 10k events
- phe/GeV ~ independent from energy
- use mean value to calibrate response
- Check linearity in [10, 100] GeV range



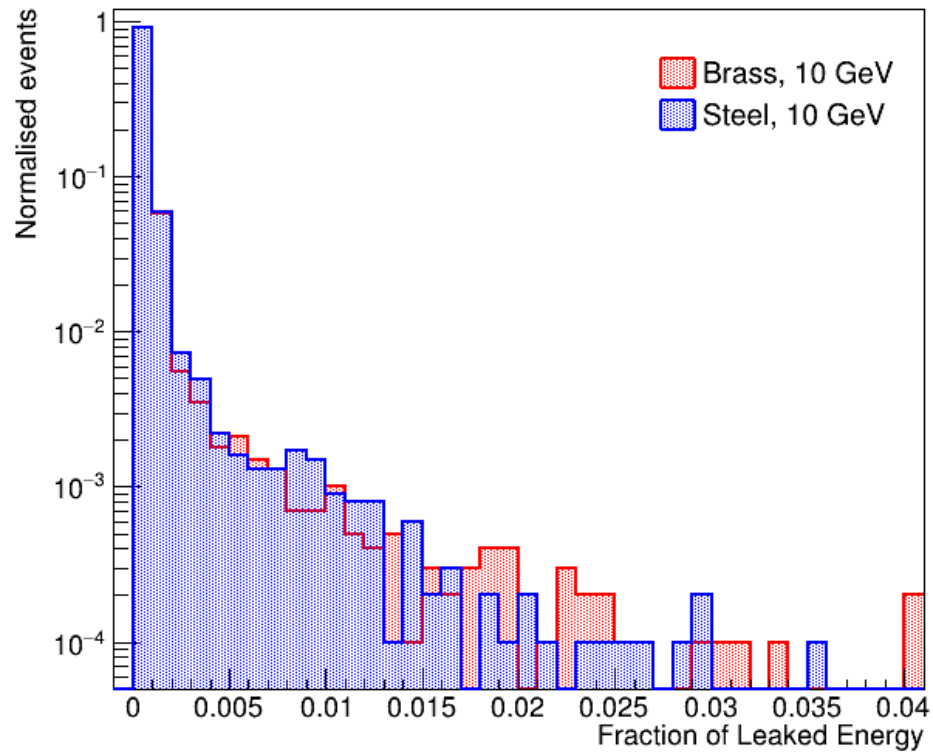
RESOLUTION

Electron resolution in [10, 100] GeV Range

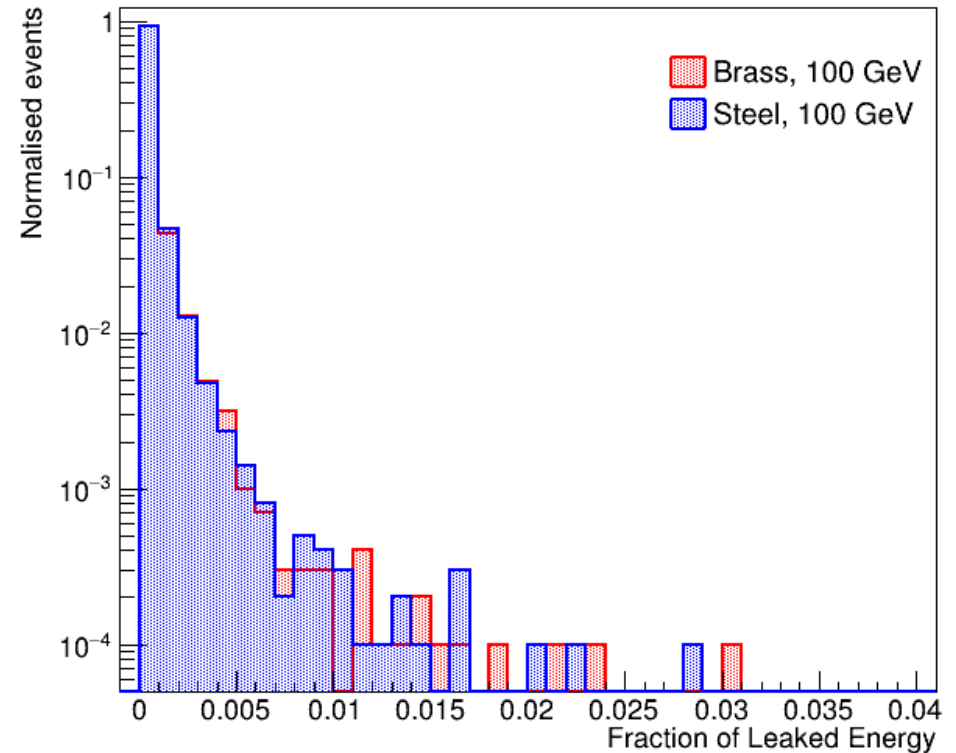


LEAKING

10 GeV



100 GeV



Albedo effect?

Pion ntuples available for both brass and steel,
analysis to be started

BACKUP

ENERGY CONTAINMENT

Used 40 GeV set to obtain the containment factor

$$\text{containment} = \frac{E_{\text{Beam}}}{E_{\text{Contained}}}$$

$$\text{Total Energy} = \text{containment} \cdot \frac{1}{2} \cdot (E_{\text{sci}} + E_{\text{che}})$$

