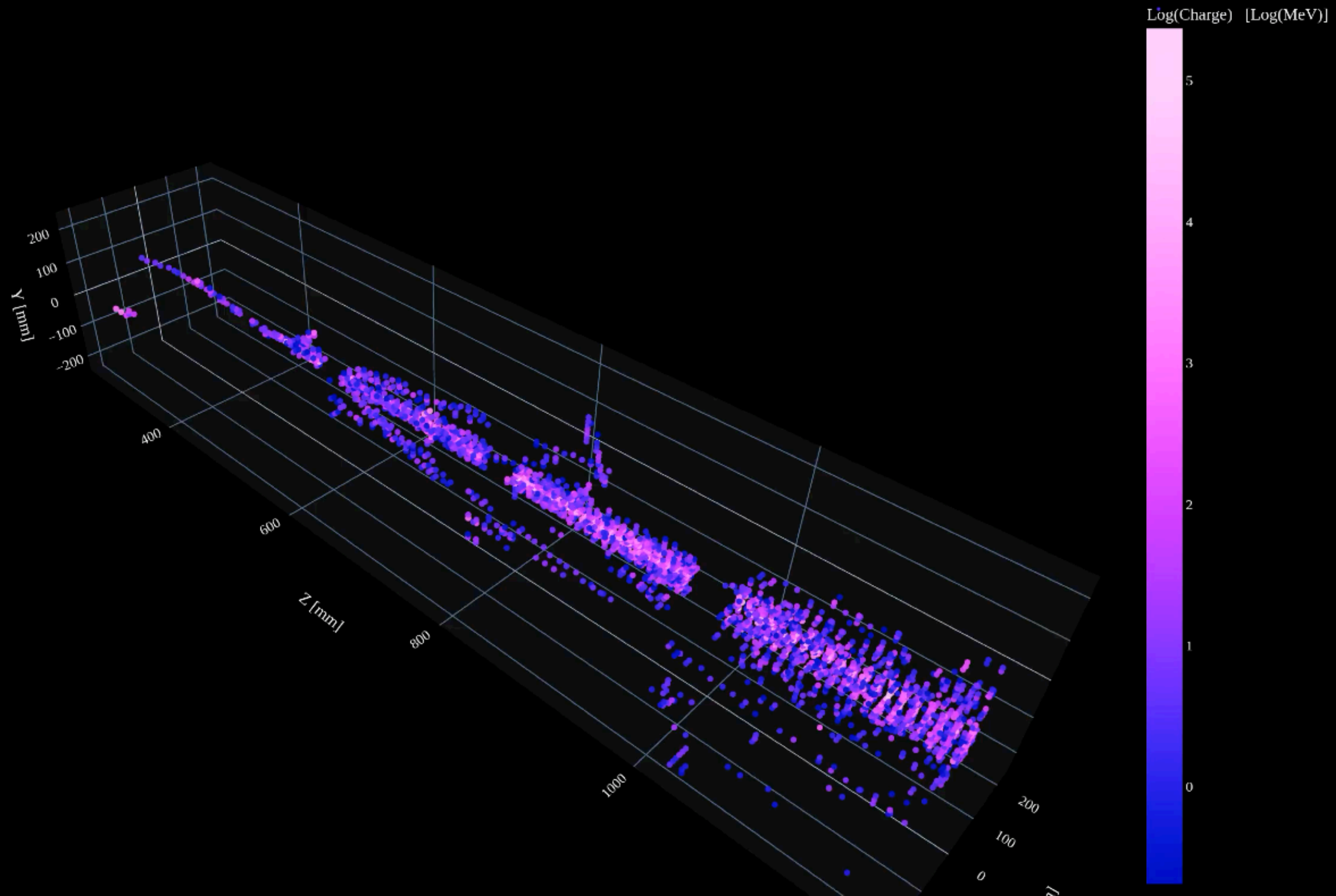
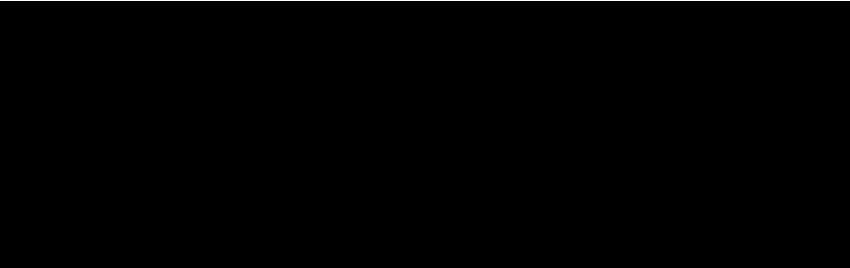


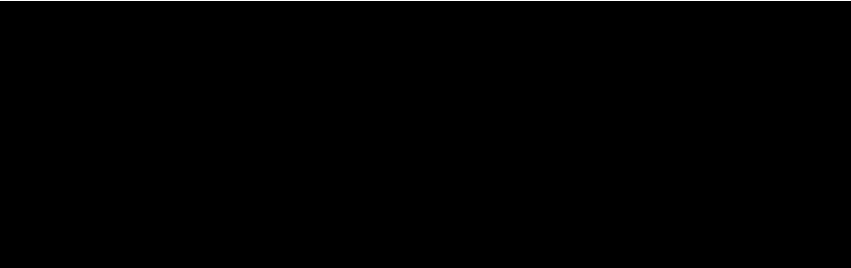
3D Hit Visualization

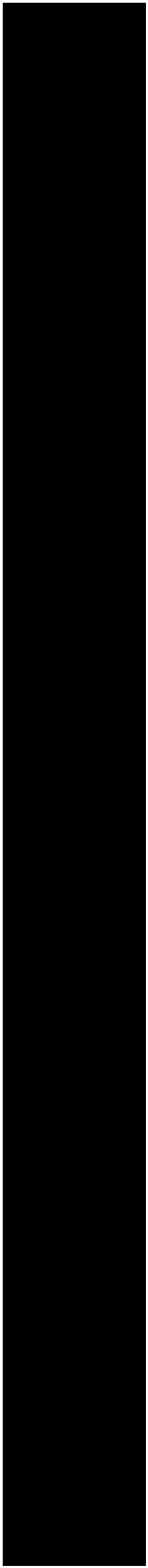




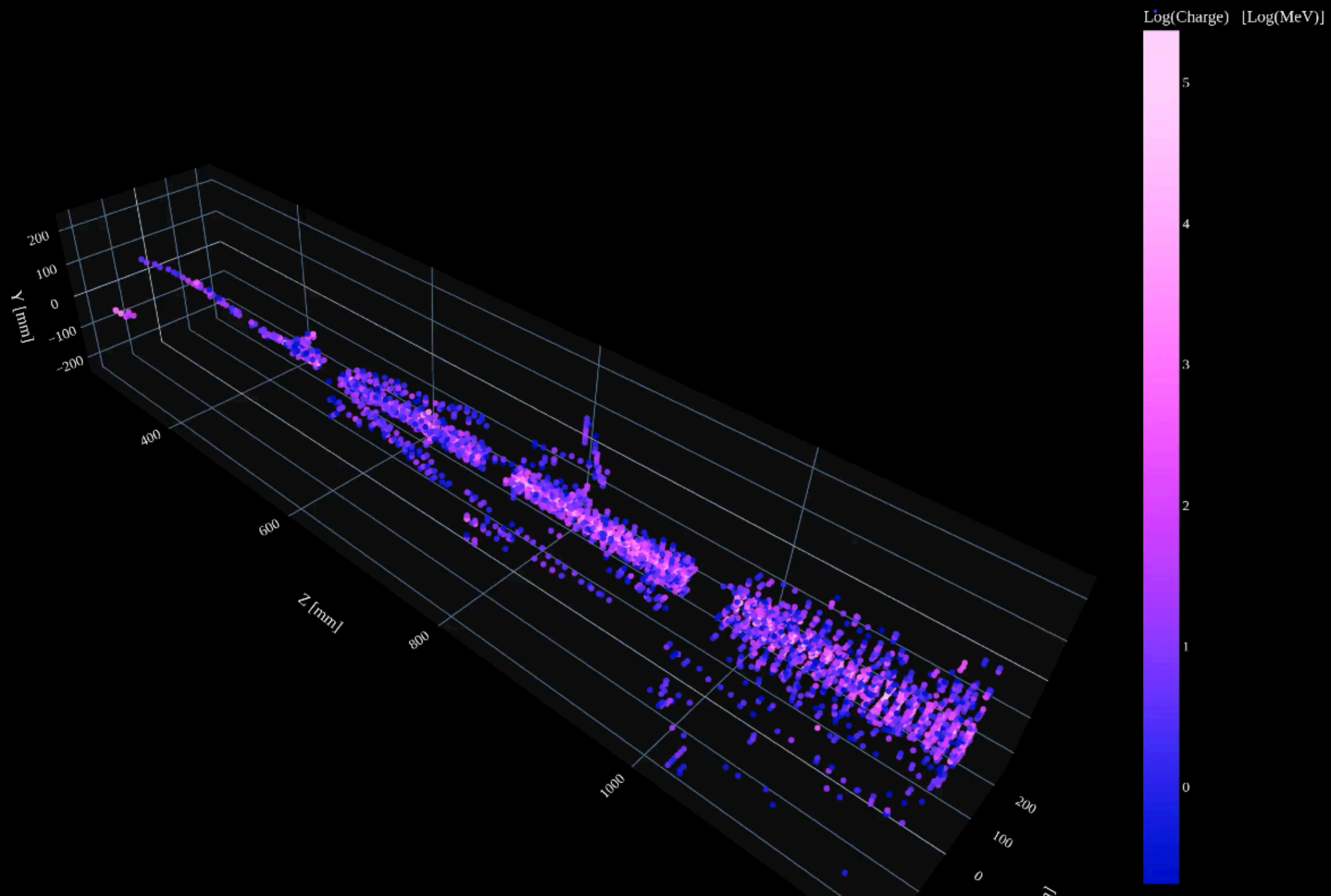




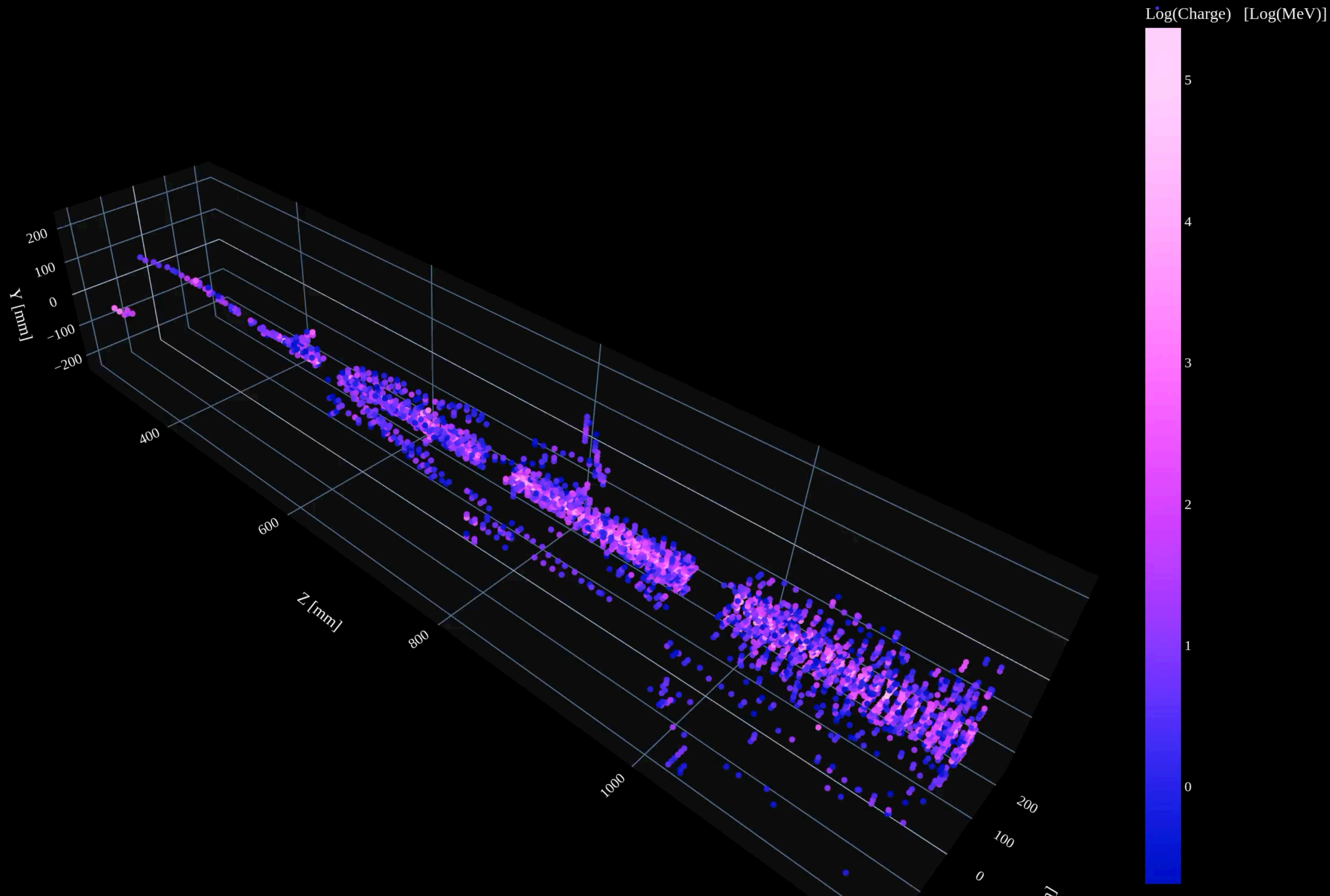




3D Hit Visualization



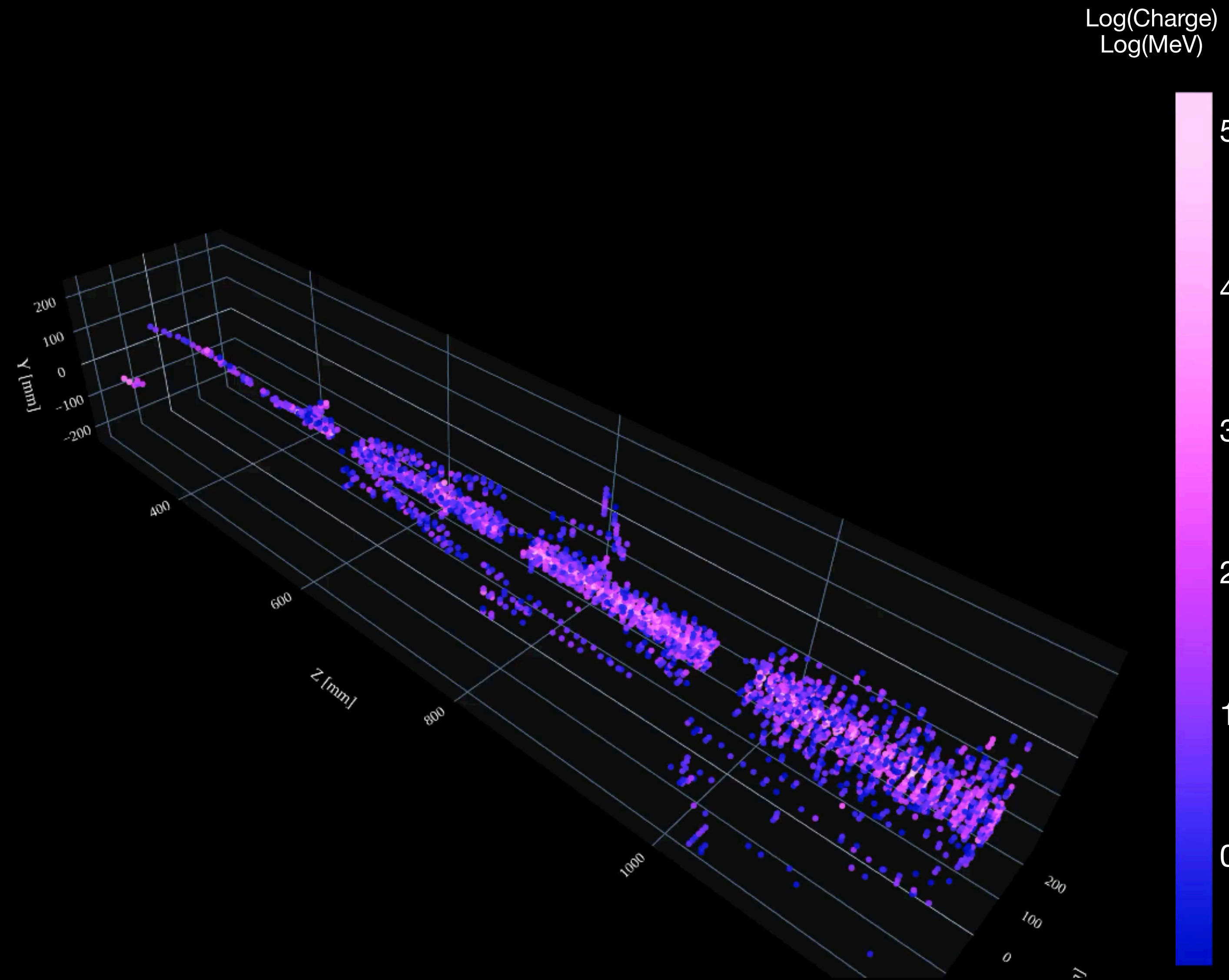
3D Hit Visualization



Event Display

FASERCal

- **Event Hits:**
 - Each point is a reconstructed voxel.
 - Detector volume is massive, but ~99% of voxels are empty.
 - *Energy patterns*: boosted forward, with complex and overlapping particle showers.
- **Goal:**
 - *Achieve full event reconstruction → classification and kinematics from this sparse data.*



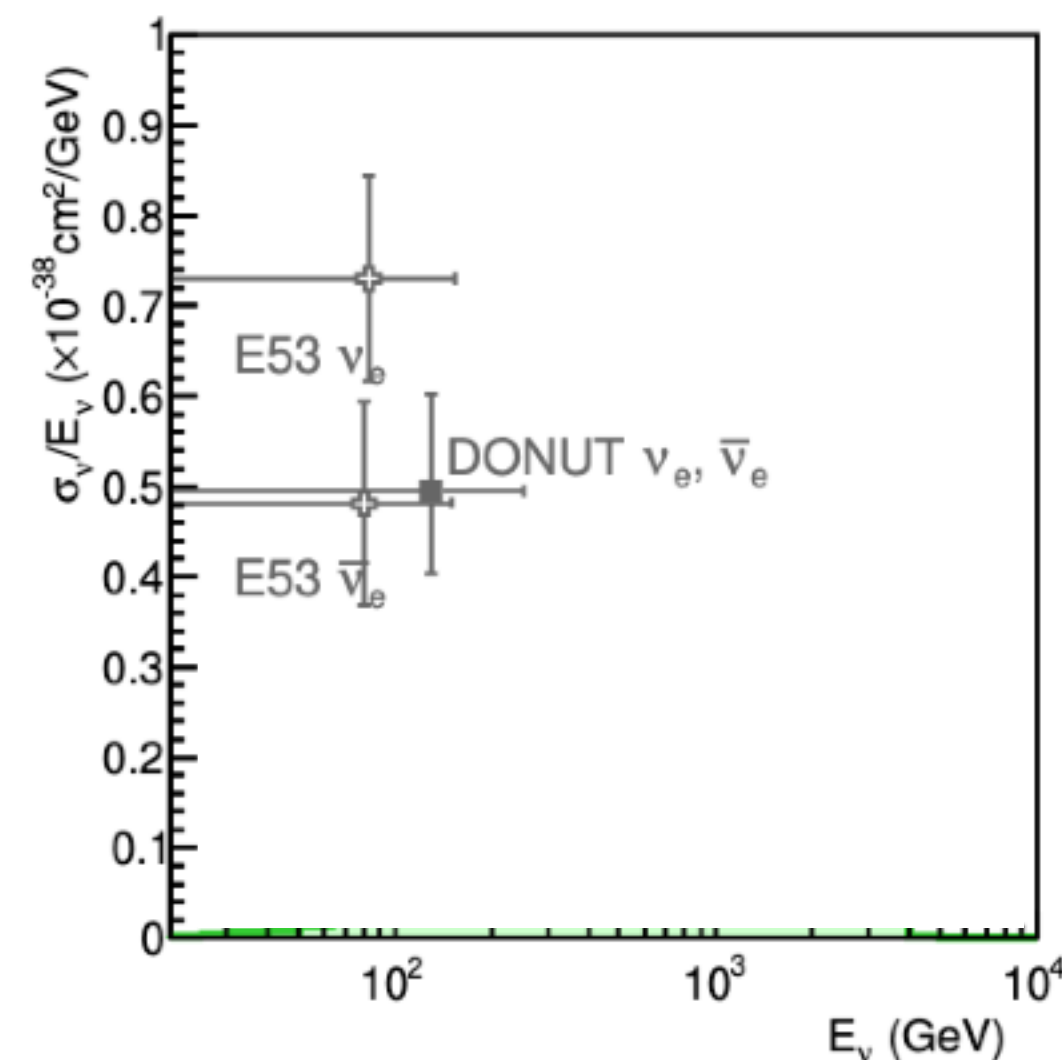
Cool, but Why?

Neutrino Physics

Primary goal: cross section measurements of different neutrino flavors at TeV energies.

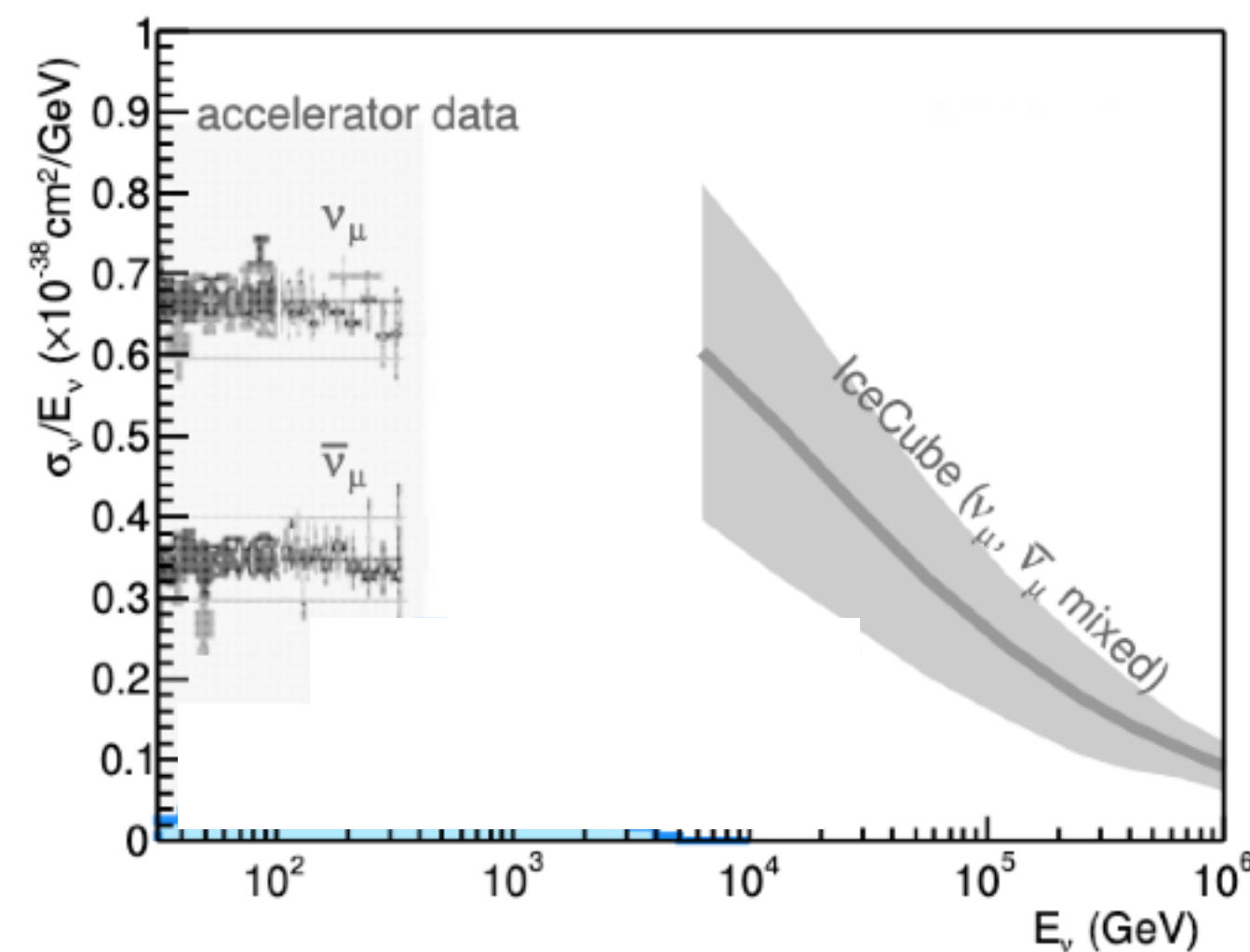
- Electron neutrinos ν_e**

- Gargamelle: up to 12 GeV.
- E53 & DONuT: up to ~200 GeV.
- No direct data above 250 GeV.



- Muon neutrinos ν_μ**

- Accelerator data: up to 360 GeV.
- IceCube: above 6.3 TeV (large uncertainties).
- Gap between 360 GeV – 6.3 TeV remains unexplored.



- Tau neutrinos ν_τ**

- Only 19 ν_τ CC interactions are directly observed.
- Super-K, IceCube: oscillated ν_τ :
 - ▶ *relative appearance rates* and don't give precise cross-section constraints.
- No measurements for $E > 250$ GeV.

