#1 Group: Event Displays

INSS 2019

Diego Andrade, Taylor Contreras, Teresa Lackey,
Nishtha Piplani, Philipp Soldin

Event Displays

- Given data, create event displays in your respective detectors
- Chosen event we will display:

Event 5	(px,py,pz) (GeV)	E (GeV)
γ	(-0.003, -0.005, 0)	0.006
τ	(-0.303, 0.365, 1.208)	2.200
p	(0.18, -0.296, -0.035)	1.001
p	(0.261, 0.302, 0.165)	1.033
p	(-0.025, -0.189, 0.297)	1.002
n	(0.035, -0.128, 0.087)	0.953
n	(-0.066, -0.009, 0.277)	0.982
n	(-0.08, -0.47, 0.134)	1.062
n	(0.002, 0.355, -0.028)	1.005
π°	(0.067, -0.036, 0.116)	0.193
n	(-0.126, 0.12, 0.072)	0.958

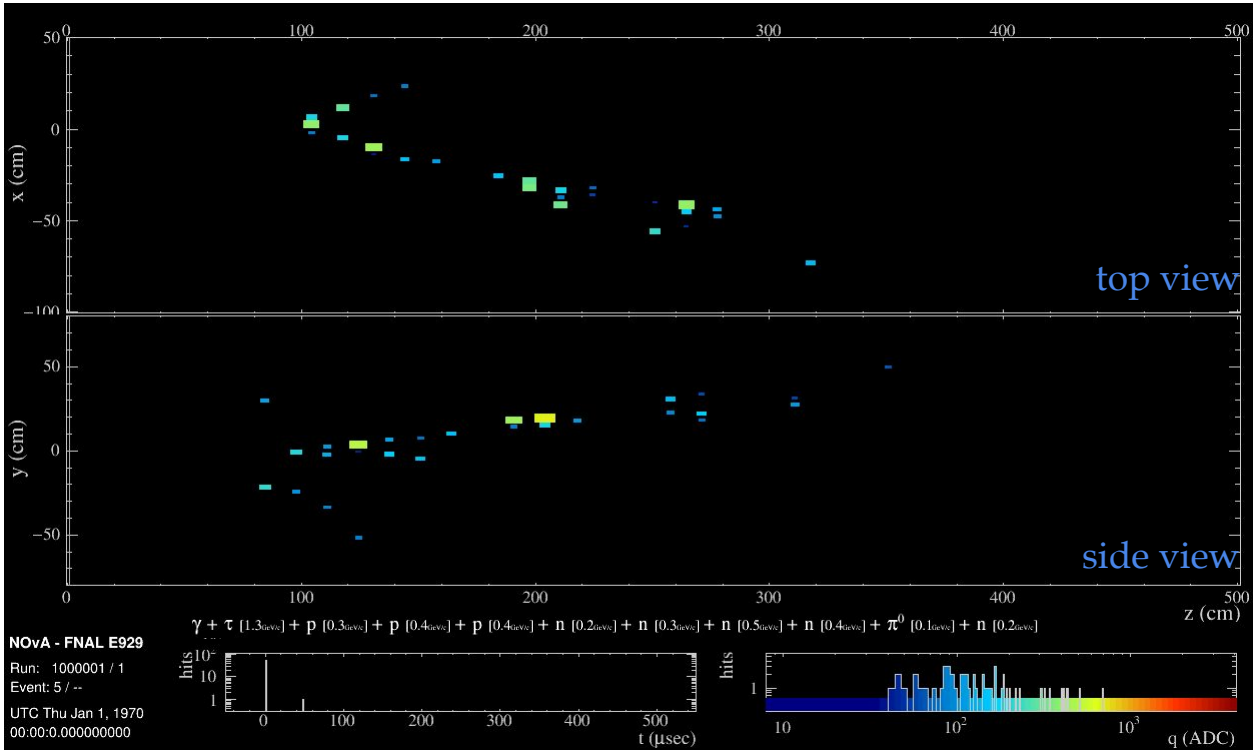
NOvA

Detector technology:

Alternating horizontal and vertical planes of extruded **PVC**, filled with **liquid scintillator**.

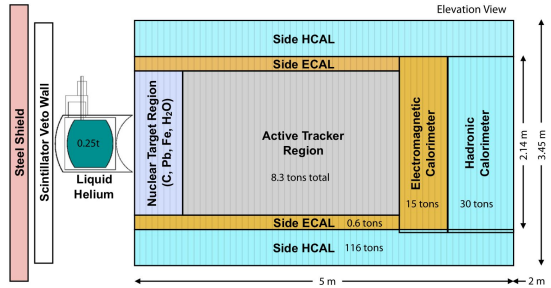
Each cell contains a **wavelength shifting fiber** that is read out by an **APD**.

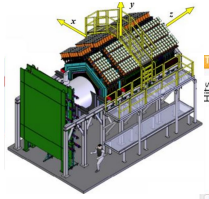
Hits in the event display = cells with charge deposits.

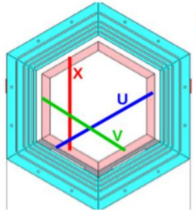


Minerva

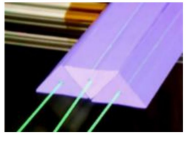
- Over 32,000 channels, 507 PMT.
- Time resolution ~ 3 ns.
- 120 modules stacked along the beam direction.
- Modules: tracking (plastic scintillator) , ECAL, HCAL and targets.
- Nuclear targets: He, C, Fe, Pb, H_2O.

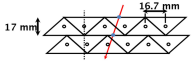




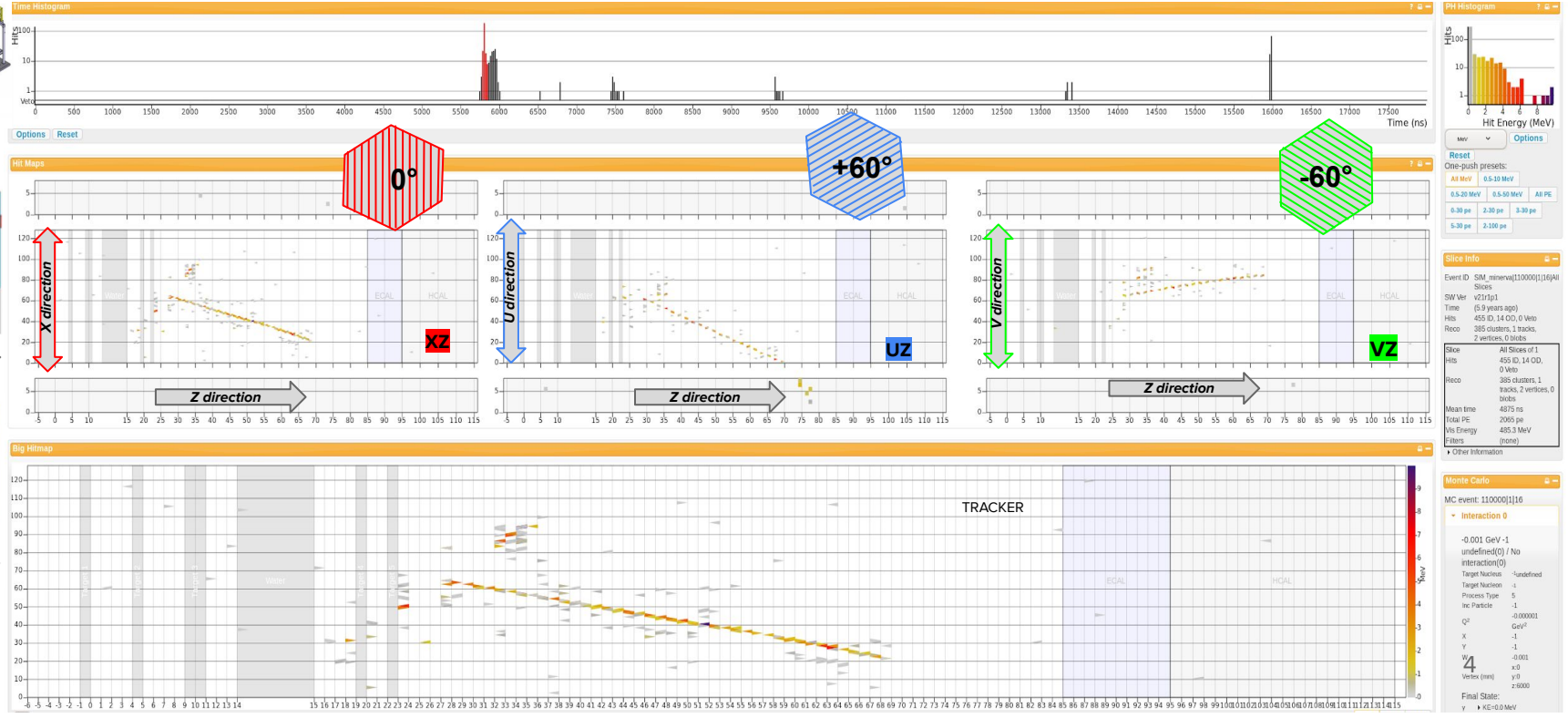


Strips orientations.





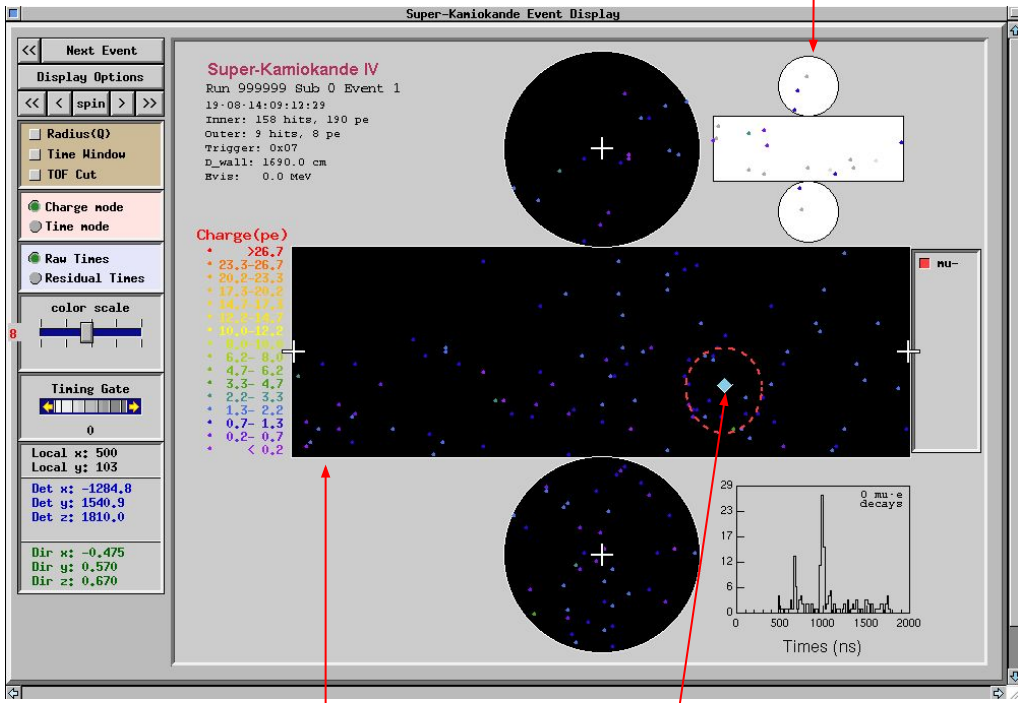
Triangular cross-section strips.



Super-Kamiokande

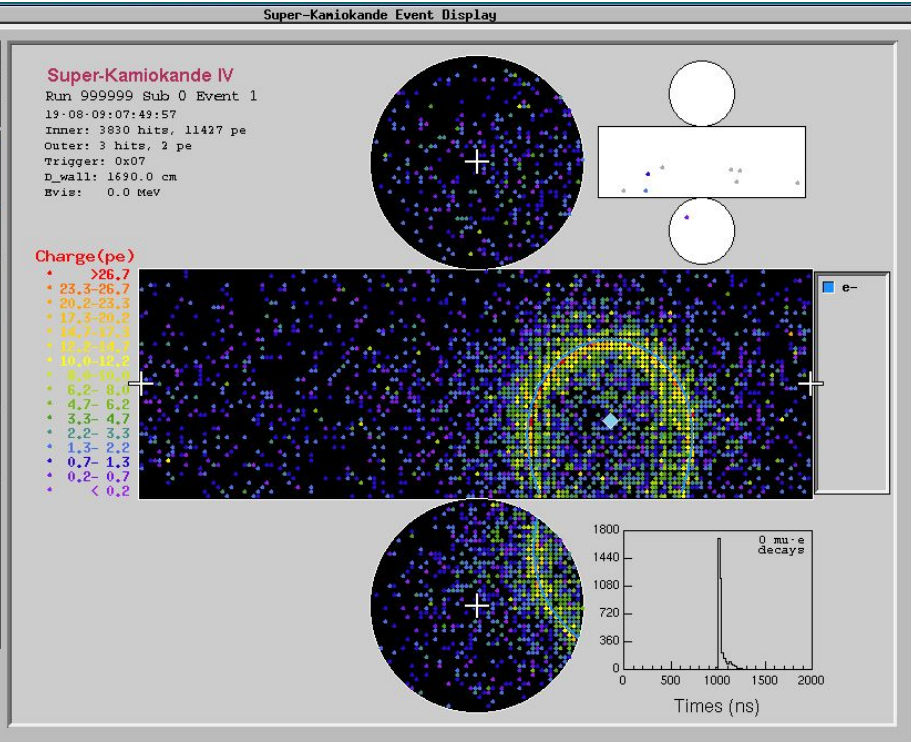
The Detector:

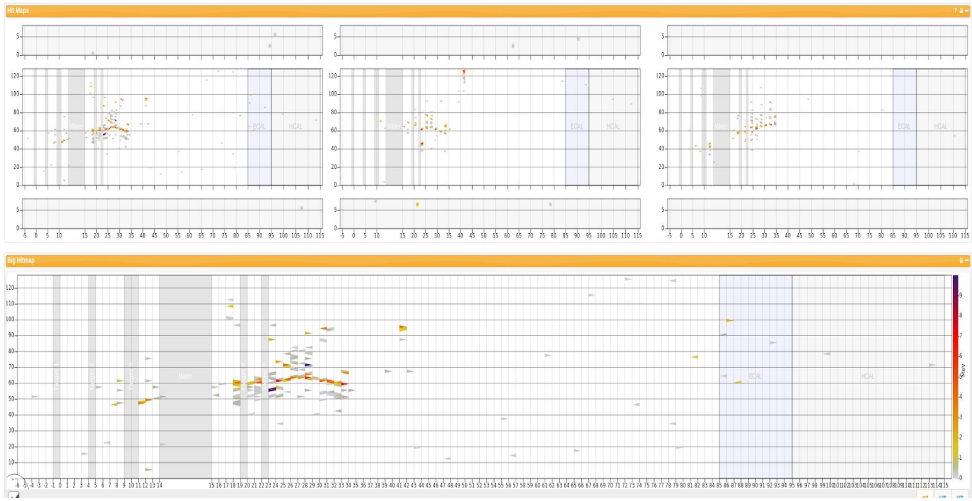
- The PMTs help in the reconstruction of the Cherenkov ring in the fiducial volume in the Inner Detector (ID).
- Each hit represents the charge accumulation on the PMT in photoelectrons (pe).
- The Outer Detector (OD) PMTs helps make sure of the event detection of up going muons or through going muons.

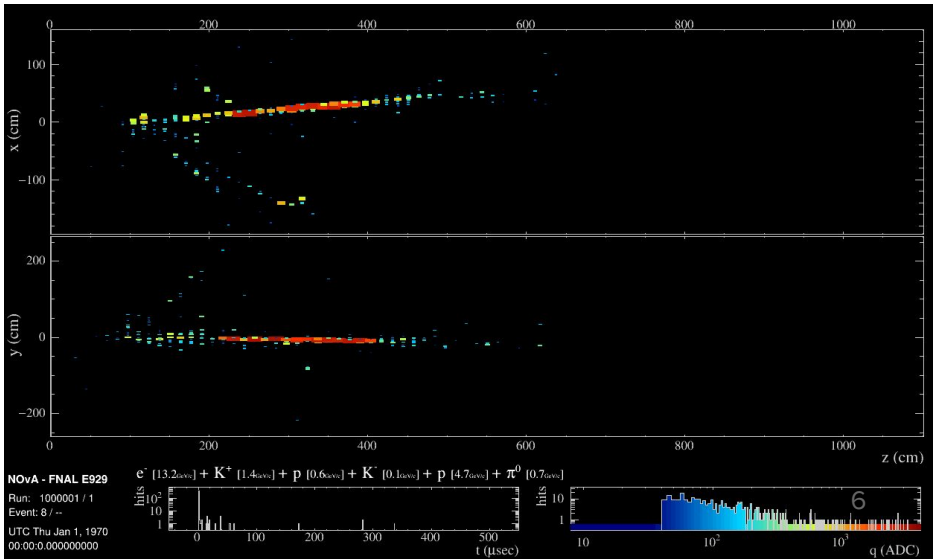


Comparisons

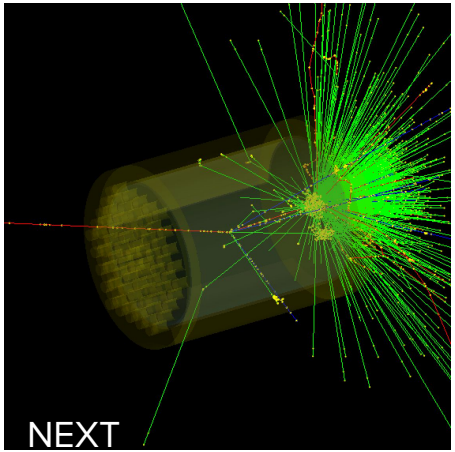
e	(1.462,-0.394,13.127)	13.33
K+	(-0.411,0.622,1.147)	1.454
p	(0.258,-0.443,0.371)	1.132
K-	(0.089,-0.014,-0.062)	0.506
p	(-1.226,0.519,4.537)	4.821
π°	(-0.071,-0.179,0.678)	0.717



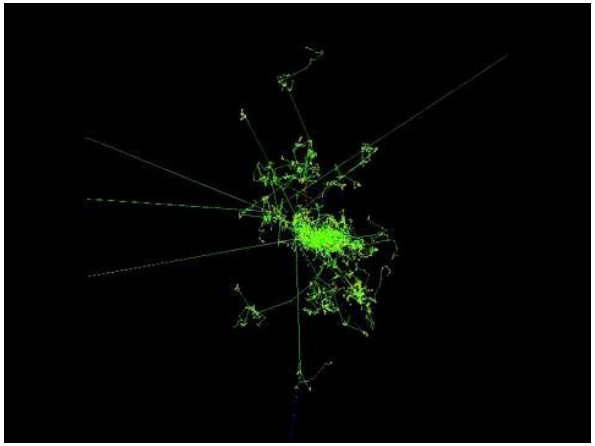




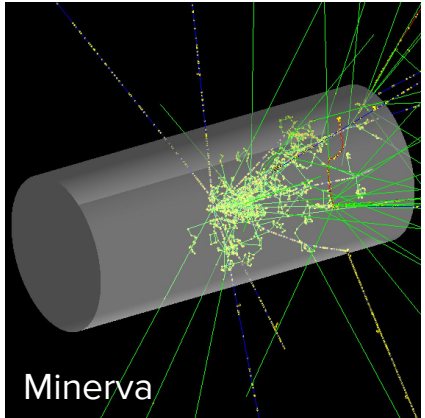
Geant4 Simulations

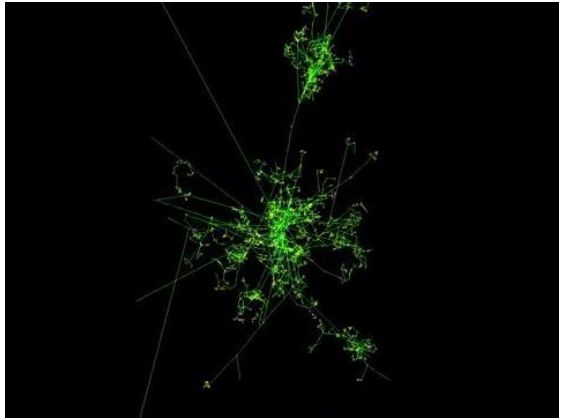


Nova



Super-K





Doublechooz

Thank You!

Did you know?

- The platypus is the only venomous mammal
- The platypus is the only mammal (other than dolphins) that locate their prey through detecting electric fields (electroreception)
- The platypus is one of five mammals that lays eggs