# The Minerva Neutrino Scattering Experiment

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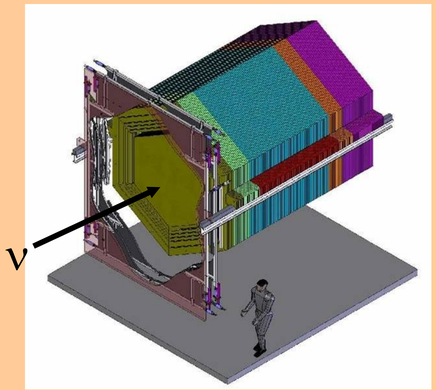
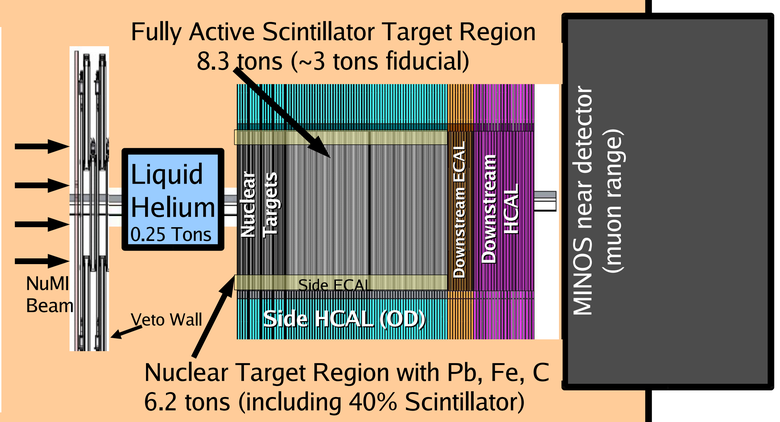
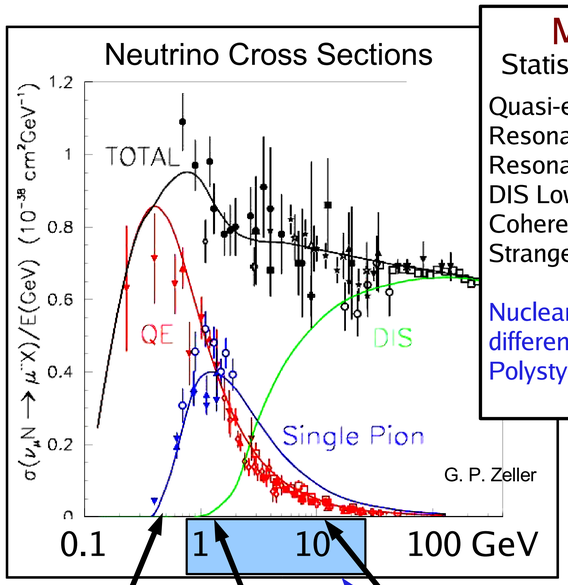
## Experiment goals and design



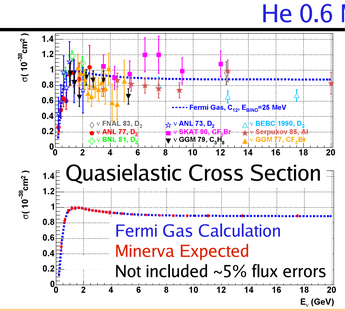




T2K
MiniBooNE
MINOS
NOvA
CNGS
NuMI Beam 1 to 20+ GeV

### MINERvA Subsample sizes

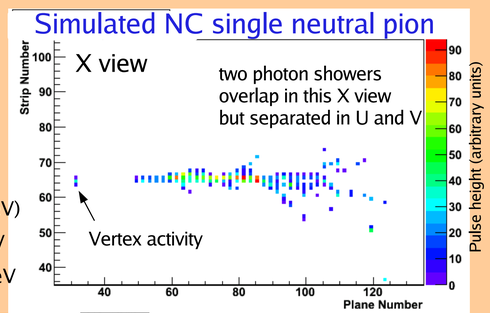
Statistics assume ~4 year run in NuMI beam

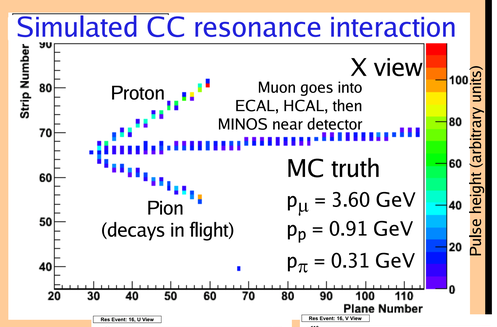
| | |
|---|---|
| Quasi-elastic neutrino scattering | 0.8 M |
| Resonance production | 1.6 M |
| Resonance to DIS transition region | 2 M |
| DIS Low Q2 region and structure functions | 4.1 M |
| Coherent Pion Production | CC 85K, NC 37 K |
| Strange and Charm particle production | 230 K |
| Nuclear effects from comparisons between different nuclear targets Polystyrene (CH), Carbon, Iron, Lead, He | C 0.4 M<br>Fe 2.0 M<br>Pb 2.5 M<br>He 0.6 M |

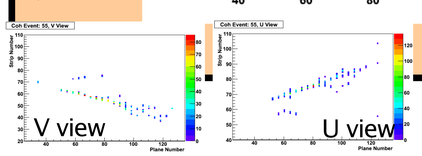



Important background to nu-e apperance

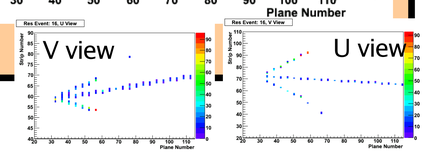
MC truth
($p_\pi$ = 1.4 GeV)
$p_\gamma$ = 1.3 GeV
$p_\gamma$ = 0.12 GeV



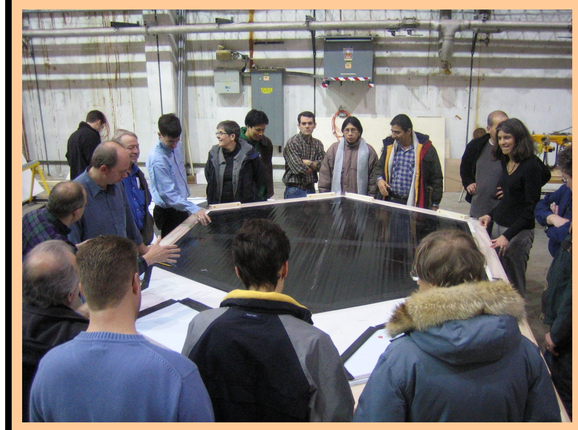




Noise and Crosstalk
Not simulated

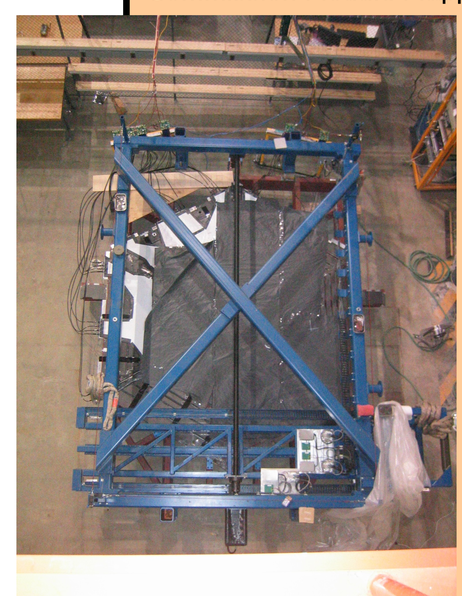



## Progress toward first data

Spring 2007 Full Module Prototype

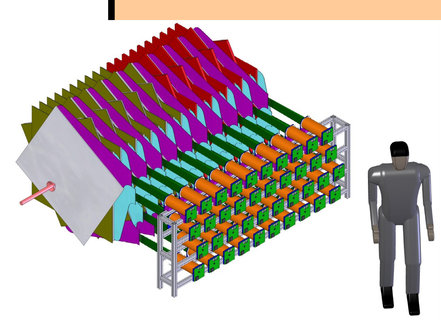


Spring 2008 (Now)
Commission Module Mapper



Spring 2008 Integration Test
PMT+Electronics+DAQ
with Light Injection System

Summer 2008
Tracking Prototype Assembly
Build & Run prototype that is
20% of full MINERvA
Shipping first TP modules



Fall 2008 Test Beam Calibrations in Mtest
Mini MINERvA with removable Fe, Pb
Hadrons and electrons down to 200 MeV/c
In new tertiary beamline

2009: MINERvA modules go into NuMI beam