Near Detector Simulation with GMINOS

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What's Right & Wrong?

- Configuration of planes (including spacing, uninstrumented spectrometer)
- z structure of scint planes (Al skin, TiO_2 layer)
- Exact strip lengths and placements within plane
  - overall plane is grouped in sets of 24 strips
  - *clipped* to approximately shapes: "full": U, V; "partial": R, S
- Coil material (but not collar)
- WLS pigtail lengths, clear fiber lengths
- No superstructure (i.e. missing feed-in splash from events nearby), no steel ears, approximately correct hall size & front wall placement for rock interactions

What's Right & Wrong? (2)

- Flux accounts for (E,θ,flavor) vs. R
- Flux is probably a little outdated
- No (appropriate) cosmic muon flux
- Event generation correctly accounts for mass distribution along neutrino line-of-flight and nuclei proportions
  - internal structure of active planes not used
- NEUGEN only supplies $\nu + p$ and $\nu + n$ cross sections; nuclei dealt with with simple addition based on (A,Z)

What's Right & Wrong? (3)

- Spill structure simulated by event overlay and redigitization
- Timing effects (WLS τ, fiber transport) accounted for
- Individual γ's (p.e's) generated
- No optical or PMT cross talk (need Alner box lacing)
- QIE bucket (53MHz) digitization, including splitting electrical pulse across buckets
- No non-linear effects, including lack of correct quantization due to range changing
- Thresholding & triggering (non-spill) are no doubt incorrect
- Electronic summation in spectrometer (need mapping)