1 Goals

To develop a Geant4 based simulation for the Braidwood detector. We take GLG4sim (Generic Liquid-scintillator anti-neutrino detector Geant4 simulation) as a starting point. The Braidwood version, BWsim, is available from the CVS site.

The short term goal, in 2-3 weeks, is a detector simulation producing results that can be compared to ReactorFsim. Longer term goals are to produce energy and other reconstructed quantity plots based on the G4 simulation to present to NuSAG.

2 Needs

Immediate needs: much can be taken from GLG4sim and code already in ReactorFsim. These topics need people working on them now in order to reach to short term goal. We currently don't even know which of these will be as simple as switches already in GLG4sim and which will require more work. These are more-or-less prioritized.

- Braidwood-specific detector geometry (Chris, Dan): some work is already done creating a basic "concentric-sphere" geometry, as in ReactorFsim
- IBD vertex generator (Dan)
- neutron capture on Gd: not a Geant4 standard process, but a "non-public" file exists which must be added and tested
- PMT model: several models exist in GLG4sim which need to be understood
- improvements to ROOT output: ROOT output is standard in GLG4sim, but no BW-specific trees exist
- general analysis tools (Stan)

Long term needs:

- reconstruction: tested code exists in ReactorFsim, will need to be adapted
- trigger/electronics
- BW-specific optical model
- interface with veto simulation: should be added in early
- optimization: once short-term goals met, can we speed up G4 without losing too much functionality?