Digitization/Noise/Signals

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LBNE

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LBNE Wire Simulation

- Wire simulation branched from MicroBooNE
  - SimWireLBNE_module.cc in DetSim
  - SignalShapingServiceLBNE.h and SignalShapingServiceLBNE_module.cc in Utilities
- Noise simulation is too processor-heavy
  - Old noise simulation creates array of noise with entry for every channel
  - In LBNE, this is 300,000 channels
  - Noise is randomly selected from array and applied to channels, so using smaller array is possible
  - Reduced array to 1000 and 100 (set by parameter), but memory still blew up to 75% for one muon with long run time (more than 30 minutes)
  - Processing is heaviest when filling ADC vectors

To Do

- Define SignalType separately for U and V induction planes to account for different responses to induced charge
- Crosstalk between neighboring channels due to wire wrapping
- Electrostatic effects in APA gaps may change response functions of charges drifting through gaps
- Wire wrapping may effect electrical transparency of induction planes