

Measurements program group plans

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Goals for next 9 months

- The goals of this group will change after the proposal is submitted/approved.
- Develop necessary tools for data analysis.
- Train a new generation of experts who will lead the analyses efforts for DUNE in the next decade.
- Get ready for data taking in spring 2018 (2.5 years).
- All the analysis need to start as soon as possible and they are included in the goals for the next 9 months.

Fundamental software tools (4 FTEs)

- Geometry (1 FTE)
 - important for correct simulation and analyses
 - reuse the FD and 35ton geometry when possible (APA, CPA, cryostat)
 - CAD->GDML conversion
- Single particle Monte Carlo (1 FTE)
 - the main MC for all analyses
 - develop/adapt tools to generate MC for various particles, energies and entry angles.
- Cosmic muons Monte Carlo (1 FTE)
 - about 68 muons in each beam event
 - develop/adapt appropriate Monte Carlo generator
 - overlap with the calibration group
- Overlays (1 FTE)
 - Merging the cosmic muons events with beam events (MC)
 - Some of the overlays code already exists (NOvA)

Reconstruction/Analysis (21 FTEs)

- **Shower calibration (6 FTE)**
 - E-M showers (π^0 , γ , e)
 - Hadronic showers (π^\pm , K^\pm , p)
 - Various energies
- **Angular dependence (1FTE)**
 - Recombination using different angles of the beam and secondary particles
- **Bethe-Bloch parameterization of charged particles and PID (8FTE)**
 - Each particle, and for various energies and angles
- **Reconstruction effects (3 FTE)**
 - Difficult angles, 2D vs. 3D reconstructions (validation of reconstruction)
- **e/γ separation (1 FTE)**
 - wire pitch, vertex activity, etc.
- **Cross section measurements (2FTE)**
 - Elastic scattering, absorption, charge exchange

Other measurements (5FTEs)

- Supernova and Michel electrons (1 FTE)
- Charge sign determination (1FTE)
- Proton decay sensitivity and background samples (1FTE)
- Anti-proton annihilation (1FTE)
- Veto cosmic muons and beam halo (1FTE)

Summary

- For the next 9 months we need to development fundamental tools for the data analysis and start all analyses.
- Total effort estimated here: 30 FTEs 😊
- Next meeting will be on June 18th at 10 AM.
 - We will make a call for a one-slide presentations what people are interested in.
 - Please let Donna or Jarek know regarding your interest in the measurement group effort.