GASEOUS ARGON TPC SIMULATION FILES

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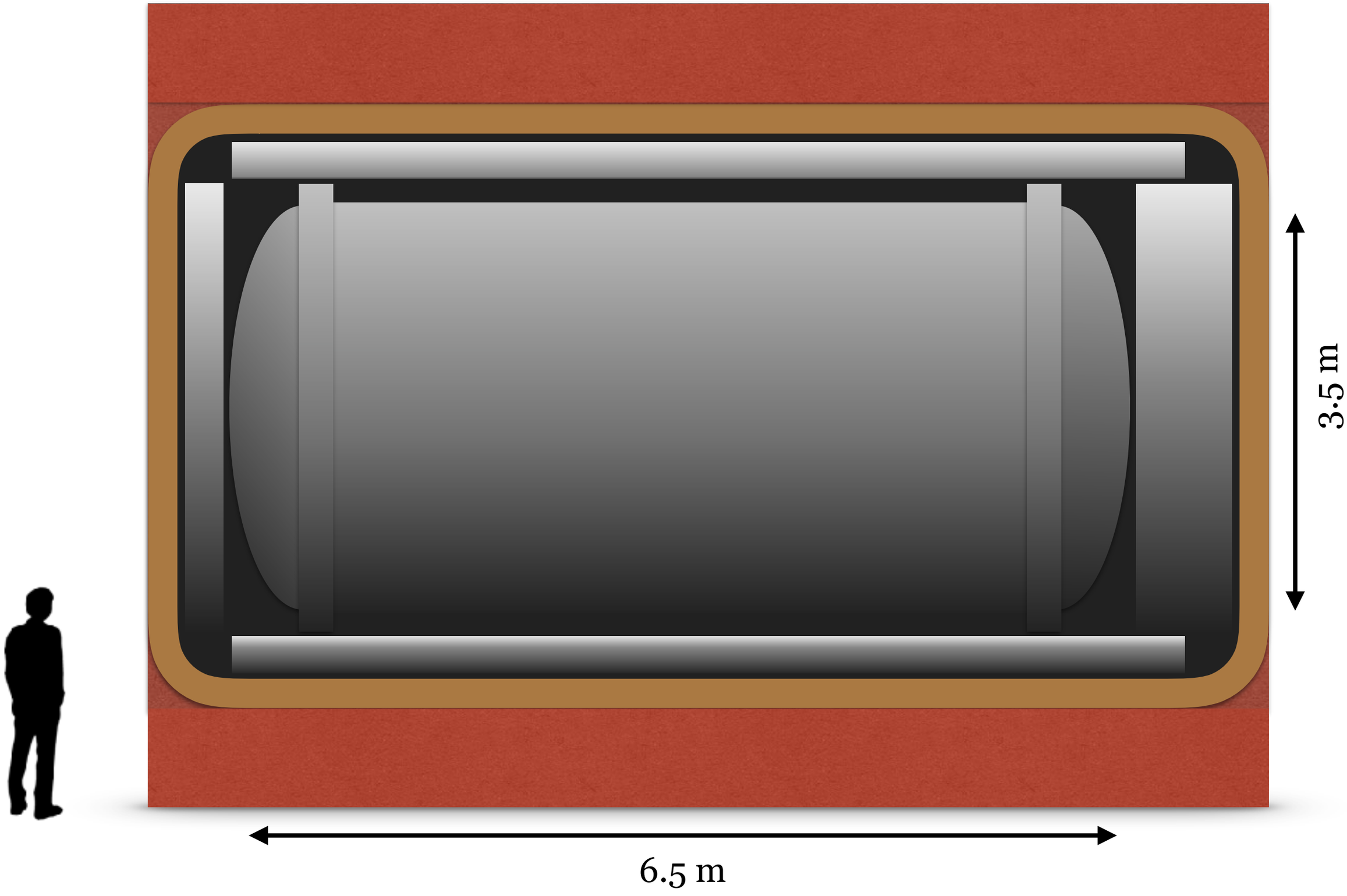
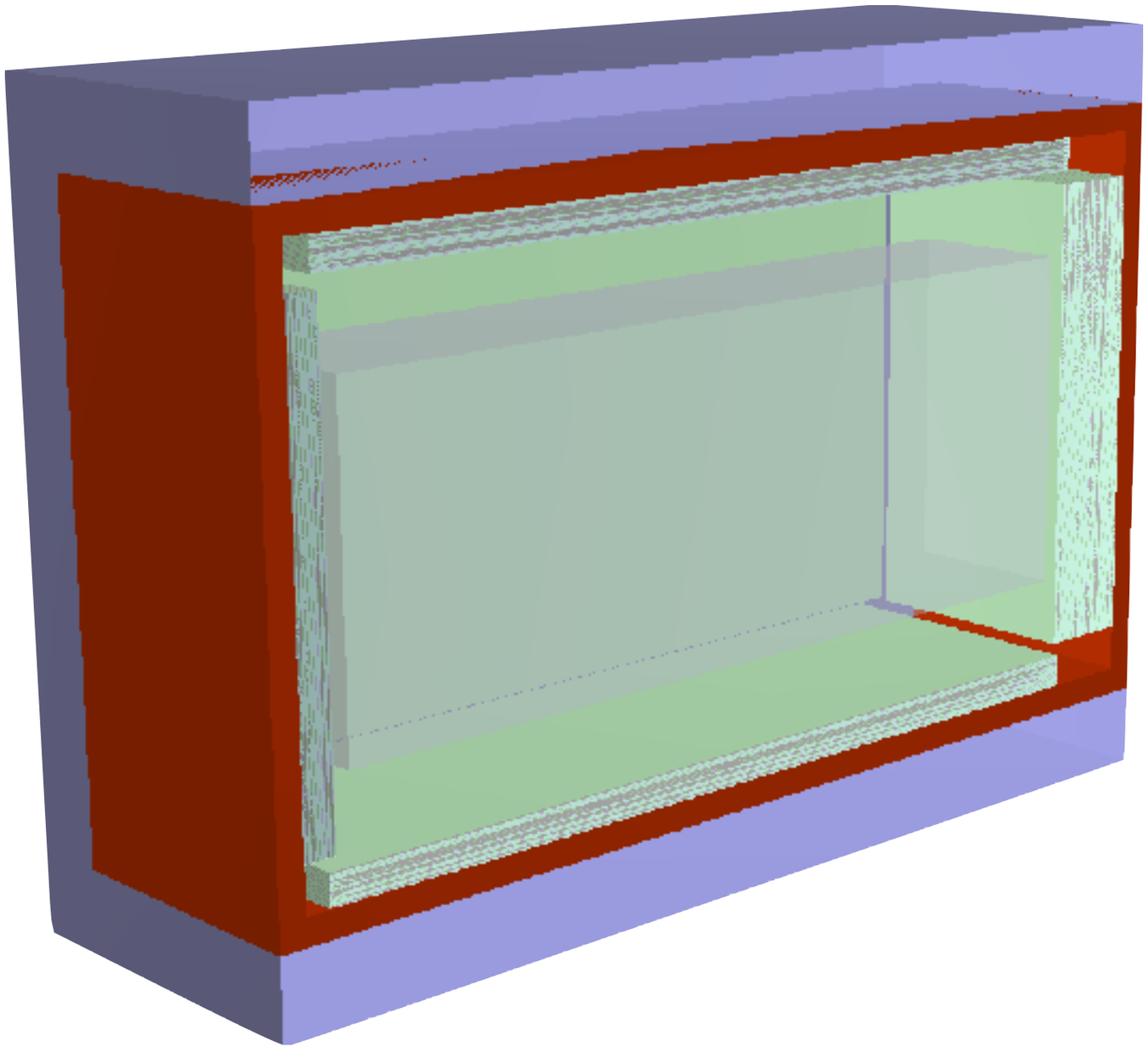
NDTF FINAL MC PRODUCTION

- About 10^{21} POT (10^{7} spills) with 1.5 billion unique detector interactions and overlay of rock interactions and cosmics.
- Used for final NDTF results described in upcoming report.
- Three types of files available:
  - GENIE record files;
  - NDTF GArTPC Geant4 simulation event record files;
  - NDTF DSTs.

NDTF GARTPC SIMULATION



NDTF GARTPC SIMULATION



NDTF DSTS

- A single ROOT file for each beam operation mode can be found at `/pnfs/dune/persistent/TaskForce_AnaTree/ndtf_output .`

- Each file consists of a tree with two branches. The first branch contains GENIE records (`genie::NtpMCEventRecord` objects); the second one contains objects of the type `ndtf::TaskForceAna`, developed by Brian Rebel for the NDTF.

- The `ndtf::TaskForceAna` object contains various true and reconstructed values for each selected neutrino interaction including the energy, inelasticity and a list of final-state particles.

- The reconstructed quantities and particles are those generated by the pseudo-reconstruction code developed for the NDTF.

- Documentation: `https://cdcvs.fnal.gov/redmine/projects/dune-ndtf/wiki/Analysis_Tree`

NDTF SIMULATION FILES

- The simulation files (both GENIE and Geant4 event records) may be valuable for some studies.

- About 100 TB of data; 50000 files for each beam operation mode. Can be found at `/pnfs/dune/tape_backed/dunepro/mc/neardet/gartpc/ndtf-4rt` .

- Event record contains all neutrino interactions and their final-state particles, relevant secondaries and their detector hits (position, time and energy).

- Event-record classes can be found at `https://github.com/DUNE/wp1-neardetector/tree/master/gastpc/evtrec` .

- New art-based simulation and reconstruction software under development.
  - NDTF simulation to be deprecated;
  - Useful bits of pseudo-reconstruction to be migrated.
- Ready to go in the next few weeks. To be used by ND design studies.
- Documentation: https://cdcvs.fnal.gov/redmine/projects/garsoft/wiki/ART-based_Software_Information