

# Development of Monte Carlo simulation and reconstruction algorithms for T2K-WAGASCI experiment

*Monday, August 26, 2019 7:00 PM (2 hours)*

T2K-WAGASCI is an experiment to measure neutrino interactions at the J-PARC neutrino beam line. WAGASCI modules have a three-dimensional grid structure of plastic scintillator bars and water, both of which form the neutrino interaction target. The Proton Module is a fully-active tracking detector consisting of only scintillator strips, therefore plays a role of plastic target. These neutrino detectors are surrounded by two side muon range detectors and a magnetized downstream muon range detector called Baby MIND. Baby MIND consists of iron-core magnet planes, with a magnetic field strength of 1.5 T, and scintillator tracking planes. It enables a reduction of the neutrino background for measurements with antineutrinos and vice versa.

The physics run with the full detector setup is planned in November 2019. The aim of this run is to measure double differential cross sections with respect to muon angle and momentum. The results will be compared against neutrino interaction models and are therefore important in the selection process for appropriate ones. A Monte Carlo simulation for the physics run was developed and has been tuned based on measurement results. Algorithms for reconstruction of track, momentum and charge were also developed and improved based on results of the simulation study. In this poster, the physics performance of the T2K-WAGASCI experiment evaluated with the simulation and the improved algorithms will be shown.

## Working Group

WG1 : Neutrino Oscillation Physics

**Primary author:** Mr YASUTOME, Kenji (Kyoto University)

**Co-author:** COLLABORATION, T2K

**Presenter:** Mr YASUTOME, Kenji (Kyoto University)

**Session Classification:** Poster session