

Using Novel Micro-channel Plate Photomultipliers in the Next Generation Water Cherenkov Neutrino Detectors

The next generation of neutrino experiments will require massive water Cherenkov detectors to reach the sensitivity needed to measure CP violation in the lepton sector and the neutrino mass hierarchy. Recently the Large Area Picosecond Collaboration has begun developing new methods to fabricate a 20cm-square thin planar multichannel plate photo-multiplier tube (MCP-PMT) at a cost comparable to those of traditional photo-multiplier tubes. The application of these novel devices to large water Cherenkov detectors could significantly enhance background rejection and vertex resolution in these detectors by improving spatial and timing information. We present details of the MCP-PMT fabrication method, and preliminary results from testing and characterization facilities at Argonne National Laboratory. Preliminary results will also be presented on the reconstruction capabilities for neutrino events in Water Cherenkov detectors.

Author: Prof. SANCHEZ, Mayly (Iowa State U/Argonne National Lab)

Presenter: Prof. SANCHEZ, Mayly (Iowa State U/Argonne National Lab)