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P1.034 Overview of the nuPRISM detector design

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nuPRISM is a proposed water Cherenkov near detector for the T2K and Hyper-K long baseline neutrino beam experiment. Sited 1km from the J-PARC beam production point, nuPRISM spans a range of off-axis angles relative to the neutrino beam direction. As the off-axis angle changes so does the beam energy spectrum, providing a way of directly relating the neutrino energy to the experimental observables.

In this poster we will describe the design of the nuPRISM detector. In particular, we will focus on the photosensors and electronics of nuPRISM. There are a number of challenging requirements for these components, including maintaining good reconstruction performance for a relatively small inner volume and handling large rate of pile-up events from the high-intensity J-PARC neutrino beam. Our design is based on having 6-18 3" PMTs assembled in acrylic spheres mounted on a PMT frame; the acrylic sphere will also enclose the low-power digitizing electronics. We will show simulated performance for different configurations of these PMT modules. Finally we will describe how we propose to build the deep nuPRISM pit and move the PMT frame through the detector volume.