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Status of the Gadolinium project for Super-Kamiokande

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EGADS (Evaluating Gadolinium's Action on Detector Systems) is a test facility for a new neutrino detection method using a gadolinium-loaded water Cherenkov detector. In this method, events due to anti-neutrino charged-current interactions on protons (i.e., inverse beta decay) are identified by the coincident detection of a prompt positron signal and a delayed gamma-ray signal from neutron capture on gadolinium [Gd] sulfate which is dissolved in the water. By introducing this method to a large water Cherenkov detector such as Super-Kamiokande we expect to achieve the first detection of the supernova relic neutrinos.

EGADS consists of a cylindrical stainless steel tank holding 200 tons of dissolved Gd solution (0.2% by mass), two hundred forty 20-inch PMTs, and special water circulation systems for pre-treatment, filtration, and gadolinium recovery. It is designed to evaluate the impact of dissolving Gd sulfate on water transparency and detector materials. In 2011 and 2012, we tested the performance of water circulation system with a 15 ton buffer tank. In the second half of 2012 we will install PMTs in the 200 ton tank and start detector commissioning with our DAQ. The current status of EGADS will be presented.

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