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GADZOOKS!

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GADZOOKS! is a upgrade project for Super-Kamiokande
with a new neutrino detection method using gadolinium-loaded water.
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 which is dissolved in the water. By introducing this method to a large water Cherenkov detector, Super-Kamiokande, we expect to achieve the first detection of the supernova relic neutrinos.

The test facility EGADS has been conducting detailed studies on the gadolinium-loaded water since 2011. EGADS consists of a cylindrical stainless steel tank holding 200 tons of dissolved Gd solution, 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. Since 2011, we have tested the performance of water circulation system. In summer 2013 we installed PMTs into the detector tank. We will start water quality testing with PMTs and detector commissioning.
The current status and plan of GADZOOKS! and the test facility EGADS will be presented.

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