Contribution ID: **37**                                                                    Type: **Poster**

# Improved detector simulation and neutron tagging study for the SK-Gd project

Super-Kamiokande Gadolinium (SK-Gd) project is an upgrade proposed to the SK detector by dissolving a Gd-compound into the detector water. With this upgrade, electron antineutrino events can be efficiently identified by tagging the 8 MeV gamma cascade emitted by a neutron capture on Gd. Utilizing this technique, we are aiming to make the first observation of the supernova relic neutrinos, as well as improving many physics programs that are currently pursued at SK.

In order to accurately estimate the impact of the upgrade, we have updated the SK detector simulation package, called SKDETSIM, to include neutron capture on Gd. We will present how we interface SKDETSIM , which is GEANT3-based, with the interaction packages in GEANT4 to utilize its comprehensive neutron data library. The simulation code have been validated with neutron gun and atmospheric neutrino simulations. Finally, the current status of developing a neutron tagging algorithm specific to Gd-capture will be discussed.

**Primary author:** TSUI, Ka Ming (RCCN, ICRR, University of Tokyo)

**Co-authors:** Prof. OKUMURA, Kimihiro (RCCN, ICRR, University of Tokyo); Prof. KAMEDA, Jun (ICRR, University of Tokyo); Prof. IKEDA, Motoyasu (ICRR, University of Tokyo); NAKAJIMA, Yasuhiro (ICRR, University of Tokyo); Prof. KOSHIO, Yusuke (Okayama University)

**Presenter:** TSUI, Ka Ming (RCCN, ICRR, University of Tokyo)

**Session Classification:** Poster Session

**Track Classification:** Neutrinos