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Development of high-sensitivity radon detector in water with continuous measurement

Radon contamination in pure water causes serious background for low energy physics in Super-Kamiokande experiment, especially, search for distortions of the solar neutrino energy spectrum induced by the MSW effect. For lowering energy threshold (currently 3.5 MeV kinetic energy), investigation of radon concentration in water with sensitivity of < 1 mBq/m³ level is important and a radon detector with sensitivity of ~ 0.1 mBq/m³ has been developed by using activated charcoal trap with some time delay.

On the other hand, real-time monitoring of Rn concentration in water with < 1 mBq/m³ level is indispensable for more dense investigation including its time evolution.

In this poster, development of high-sensitivity radon detector for water with continuous measurement is presented. It consists of existing 80 L radon detector for air with sensitivity < 1 mBq/m³ and a degasifier module located at optimized position to maximize detection efficiency.

Mini-abstract

Development of high-sensitivity water radon detector for Super-Kamiokande experiment is presented.

Primary author: Prof. TAKEDA, Atsushi (Institute for Cosmic Ray Research, University of Tokyo)

Co-authors: Mr OKAMOTO, Kohei (ICRR, University of Tokyo); Mr YAMAMOTO, Shotaro (Kobe University); Dr TAKEUCHI, Yasuo (Dept. of Physics, Grad. School of Science, Kobe Univ.); NAKANO, Yuuki (The Univ. of Tokyo)

Presenter: Prof. TAKEDA, Atsushi (Institute for Cosmic Ray Research, University of Tokyo)

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