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Measurement of cosmogenic Li-9 in SK-Gd

We measured ^9Li isotopic nuclei produced by muon spallation using the data taken from 2020 to 2022 by the Super-Kamiokande detector with 0.011% gadolinium concentration in water. ^9Li is a long-lived radioactive isotope with a lifetime of about 0.26 seconds. It emits an electron and a neutron at a branching ratio of 50.8%, which is difficult to distinguish from the inverse beta decay caused by anti-electron neutrinos. Therefore, ^9Li is one of the main background sources. In this study, the energy spectrum of the electrons was measured with a threshold at 4.5 MeV which is lowered from the previous result with 7.5 MeV threshold measured with pure water. We will report the measurement method and analysis status in this poster.

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