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P3.078 Radon background study in Super-Kamiokande

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Super-Kamiokande (SK), a 50 kton water Cherenkov detector in Japan, observes ^8B solar neutrinos with neutrino-electron elastic scattering. SK searches for distortions of the solar neutrino energy spectrum caused by the edge of the MSW resonance in the core of the Sun. The installation of new front-end electronics in 2008 marks the beginning of the 4th phase of SK (SK-IV). With the improvement of the water circulation system, calibration methods, reduction cuts, this phase achieved the lowest energy threshold thus far (3.5 MeV kinetic energy). To improve the sensitivity to the MSW effect, it is required to achieve lower energy threshold. For this purpose, understanding the origin of background events and reducing them are important. Currently, the main background is known as a beta decay of ^{214}Bi in a Radon decay chain. So far, SK collaboration has developed several techniques for studying Radon contamination in the SK water. In this poster, a measurement system which can measure Radon concentration in the SK water with the accuracy of 0.1 mBq/m³ level is presented. In addition, an evaluation of Radon background events in SK injecting Radon rich water into the SK tank, as well as future prospects are also presented.