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Low energy radioactivity BG model in Super-Kamiokande detector from SK-IV data

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The radioactivity background are among the main backgrounds (BGs) affecting low energy neutrino analysis in Super-Kamiokande (SK), like the solar neutrino analysis. Among them, the main contribution is coming from Rn-222, which is spread in the detector's water due to the water source and to the PMTs emanations. However, up to now, its exact distribution in the detector was not known. Using our knowledge of the radon concentration in the detector water, and the SK-IV solar data, we developed a model of the radon distribution in the detector. We also studied and modeled the impact of the Tl-208 decays from the PMTs, which affect the same energy region than Rn-222.

This model will allow to improve our understanding of the low energy BGs affecting the SK experiment, it could also be useful for future experiments like Hyper-Kamiokande.

Keywords

Neutrino; Radon; Model; Low background

Collaboration

other Collaboration

Super-Kamiokande

Subcategory

Experimental Methods & Instrumentation

Primary author: PRONOST, Guillaume (Kamioka Observatory, ICRR, The University of Tokyo)

Presenter: PRONOST, Guillaume (Kamioka Observatory, ICRR, The University of Tokyo)

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