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Effect of the overburden on the geoneutrino signal at SNO+

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The SNO+ detector is designed to achieve several fundamental physics goals as a low-background experiment, particularly measuring the Earth's geoneutrino flux. The detector is located at SNOLAB, one of the deepest underground laboratories in the world with an overburden of 2092 m. The geoneutrino signal from originated from the 50×50 km upper crust surrounding the detector is estimated adopting a refined 3D model and a full calculation of survival probability. Specifically, the effect of the 2 km overburden on the predicted crustal geoneutrino signal at SNO+ is evaluated. A signal difference corresponding to the ~5% of the total crustal contribution, is found comparing this signal with that obtained by placing SNO+ at sea level.

Author: Dr STRATI, Virginia (University of Ferrara, Department of Physics and Earth Sciences, Ferrara, Italy; INFN, Ferrara Section, Ferrara, Italy)

Co-authors: Dr WIPPERFURTH, Scott A. (Department of Geology, University of Maryland, College Park, Maryland, USA); Dr BALDONCINI, Marica (University of Ferrara, Department of Physics and Earth Sciences, Ferrara, Italy); MCDONOUGH, William (Department of Geology, University of Maryland, College Park, Maryland, USA; Department of Earth and Planetary Materials Science and Research Center for Neutrino Science, Graduate School of Science, Tohoku University, Sendai, Japan.); Ms GIZZI, Sara (University of Ferrara, Department of Physics and Earth Sciences, Ferrara, Italy); MANTOVANI, Fabio (University of Ferrara, Department of Physics and Earth Sciences, Ferrara, Italy; INFN, Ferrara Section, Ferrara, Italy)

Presenter: Dr STRATI, Virginia (University of Ferrara, Department of Physics and Earth Sciences, Ferrara, Italy; INFN, Ferrara Section, Ferrara, Italy)

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