

Geo-neutrino results with Borexino

Tuesday, 6 October 2015 13:15 (15)

Borexino is a liquid scintillator detector primarily designed to observe solar neutrinos. Due to its low background level as well as its position in a nuclear free country, Italy, Borexino is also sensitive to geo-neutrinos. Borexino is leading this interdisciplinary field of neutrino geoscience by studying electron antineutrinos which are emitted from the decay of radioactive isotopes present in the crust and the mantle of the Earth. With 2056 days of data taken between December 2007 and March 2015, Borexino observed 77 antineutrino candidates. If we assume a chondritic Th/U mass ratio of 3.9, the number of geo-neutrino events is found to be $23.7^{+6.5}_{-5.7}$ (stat) $^{+0.9}_{-0.6}$ (syst). With this measurement, Borexino alone is able to reject the null geo-neutrino signal at 5.9σ , to claim a geo-neutrino signal from the mantle at 98 % C.L. and to restrict the radiogenic heat production for U and Th between 23 and 36 TW. I will review these geo-neutrino results obtained recently with Borexino.

Presentation type

Section talk (10+5 min)

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Session Classification : Nuclear physics and particle physics - parallel II

Track Classification : Nuclear physics and particle physics