



Contribution ID: 12

Type: Poster

Measurement of geo-neutrinos detected in the Borexino experiment at the Laboratori Nazionali del Gran Sasso

This work presents a measurement of geo-neutrinos detected in the Borexino experiment at the Laboratori Nazionali del Gran Sasso in central Italy. Geo-neutrinos are electron anti-neutrinos produced in our planet by beta decays of naturally occurring radioactive isotopes; they provide a new tool to directly probe the interior of the Earth. The present measurement, obtained from 1353 days of data, corresponds to an exposure of $(3.69 \pm 0.16) \times 10^{31}$ proton \times year. After all selection cuts and background subtraction made in the analysis, the number of detected geo-neutrino (assuming a fixed chondritic Th/U mass ratio of 3.9), is of (14.3 ± 4.4) events. The corresponding geo-neutrino signal is $S_{\text{geo}} = (38.8 \pm 12.0)$ TNU. If U and Th contributions are left as free parameters in the fit, central values of $S_{\text{Th}} = (10.6 \pm 12.7)$ TNU and $S_{\text{U}} = (26.5 \pm 19.5)$ TNU are obtained. The Borexino data are compatible with a mantle geo-neutrino signal of (15.4 ± 12.3) TNU. The combination of the Borexino and the KamLAND data allows to extract a geo-neutrino mantle signal of (14.1 ± 8.1) TNU.

Primary author: Dr MIRAMONTI, Lino (Milano University and INFN)

Presenter: Dr MIRAMONTI, Lino (Milano University and INFN)

Track Classification: Geo-neutrinos