

CENTRE D'ETUDES NUCLÉAIRES DE
BORDEAUX-GRADIGNAN

Vendredi 16 Octobre 2015

à

11H

Un café sera servi à partir de 10h45

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**Solar neutrino and latest
geo-neutrino results with Borexino**

Borexino is a liquid scintillator detector primarily designed to observe solar neutrinos. Thanks to the intrinsic radiopurity achieved in the scintillator, Borexino already measured the rate of neutrinos coming from the pp , pep , ${}^7\text{Be}$ and ${}^8\text{B}$ processes which take place inside the Sun. 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 the solar neutrino results obtained so far before focusing on the latest geo-neutrino results released by Borexino.

Salle des Séminaires du CENBG

Le Haut Vigneau - BP 120 - F-33175 Gradignan Cedex