



Contribution ID: 599

Type: **Parallel session talk**

Improved geoneutrinos observation with Borexino detector

Monday, 26 July 2021 15:35 (20 minutes)

Geoneutrinos, which are anti-neutrinos emitted from the decays of long-lived radioactive elements inside the Earth, are unique messengers of internal regions of our planet. The Borexino detector, located at Laboratori Nazionali del Gran Sasso in Italy, is able to detect the geoneutrinos through inverse beta decay reaction. This measurement is feasible thanks to the large scintillator target mass and unprecedented radiopurity, the long distance to nuclear reactors and the natural shielding provided by the Gran Sasso rock.

In this talk, the most updated geoneutrino analysis will be presented, including data from December 2007 to April 2019. Thanks to an improved analysis with optimized data selection cuts, enlarged fiducial volume, and sophisticated cosmogenic veto, the dataset exposure is enhanced by a factor of two with respect to the previous Borexino measurement from 2015.

The statistics increase, along with updated analysis techniques, allowed to measure the geoneutrinos flux with unprecedented precision level, also confirming the presence of a mantle signal. Fundamental geological information about our planet is inferred, as the Uranium and Thorium contents of the mantle, and the Earth radiogenic heat. Moreover, the existence of a possible georeactor located at the center of the Earth has been excluded at 95% C.L.

Collaboration / Activity

Borexino Collaboration

First author

Email

Primary author: BASILICO, Davide (University of Milan / INFN Milano)

Presenter: BASILICO, Davide (University of Milan / INFN Milano)

Session Classification: T04: Neutrino Physics

Track Classification: Neutrino Physics