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Extraction of Bi-210 via Po-210 for CNO neutrino detection with Borexino

Borexino is a 280-ton liquid scintillator detector located at the Laboratori Nazionali del Gran Sasso, Italy. Its current primary goal is the detection of neutrinos from the CNO cycle in the Sun using both counting and spectral shape analyses. The main challenge is posed by the similar spectral shapes of CNO neutrinos and the ^{210}Bi background, a beta emitter. A measurement of the ^{210}Bi rate would greatly improve Borexino's sensitivity to CNO neutrinos. Ideally, ^{210}Bi should be in secular equilibrium with ^{210}Po and the measurement of ^{210}Po , an alpha emitter, is possible through pulse-shape discrimination techniques. A thermal insulation campaign performed in 2015 has stabilised the detector, thereby reducing the convective motion of ^{210}Po from peripheral sources. This poster will present our strategy to extract the ^{210}Bi from a stable region near the center of the detector using different methods.

Mini-abstract

^{210}Po homogeneity in Borexino gives a ^{210}Bi upper limit for CNO neutrino detection

Experiment/Collaboration

Borexino Collaboration

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