

SuperNEMO $0\nu\beta\beta$ sensitivity studies

SuperNEMO is searching for the neutrinoless double-beta decay process which, if observed, would prove the Majorana nature of the neutrino. It builds on the strengths of its predecessor, NEMO-3, which has set competitive $0\nu\beta\beta$ limits for multiple isotopes. Using an improved version of NEMO-3's tracker-calorimeter architecture, the SuperNEMO demonstrator aims to measure the $0\nu\beta\beta$ half-life of ^{82}Se with a sensitivity of 6×10^{24} years for 17.5 kg.years of exposure. We will begin taking data in 2018.

To reach this sensitivity, we need to have excellent control of backgrounds. This poster will show how our unique, high-resolution tracking design gives us an unprecedented ability to exclude and constrain our backgrounds, particularly those due to radon and natural ^{214}Bi and ^{208}Tl contamination of our $\beta\beta$ sources. We will explain how we reconstruct events generated by various processes, and how we use them to estimate our sensitivity.

Authorship annotation

On behalf of the SuperNEMO Collaboration

Session and Location

Monday Session, Poster Wall #45 (Auditorium Gallery Right)

Poster included in proceedings:

yes

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Track Classification: Poster (participating in poster prize competition)