



Poster session 1 - Monday 4 July

P1.076 The SuperNemo ^{82}Se $\beta\beta 0\nu$ -source-foils and their radiopurity measurement with the BiPo-3 detector

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on behalf of SuperNEMO collaboration

The SuperNemo collaboration is currently building the SuperNemo demonstrator at the Modane Underground Laboratory, as the proof of concept for the full SuperNemo program. The enriched $\beta\beta 0\nu$ source consisting of thin foils ($\sim 55 \text{ mg/cm}^2$) containing 7 kg of ^{82}Se is enclosed by the gas tracker and the plastic scintillator calorimeter. The full reconstruction of the $\beta\beta 0\nu$ event topology ensures an excellent background rejection and points at a true zero-background search. One of the most critical sources of background is a contamination in the source foils. The required radiopurity is $^{208}\text{Tl} < 2 \mu\text{Bq/kg}$ and $^{214}\text{Bi} < 10 \mu\text{Bq/kg}$ to achieve the sensitivity $T_{1/2}(\beta\beta 0\nu) > 10^{26}$ years.

The collaboration has developed a dedicated detector to measure the ultra high natural radiopurities requested, the BiPo3 detector, installed in the Canfranc Underground Laboratory. The experimental design and performances of BiPo3 will be presented. Dedicated background measurements have been performed. After an exposure of about 2 years.m² the surface activities of the scintillators of $A(^{208}\text{Tl}) = 1.0 \pm 0.2 \mu\text{Bq/m}^2$ and $A(^{214}\text{Bi}) = 1.0 \pm 0.3 \mu\text{Bq/m}^2$ are reported. Results of the ^{208}Tl and ^{214}Bi activity measurements of the first enriched ^{82}Se foils of SuperNemo will be presented.