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Study of 2β decays of ^{150}Nd.

Friday, July 21, 2023 12:15 PM (25 minutes)

The 2β decay of ^{150}Nd to the first excited 0^+_1 level of ^{150}Sm (E_{exc} = 740.5 keV) was studied using a low-background experimental setup composed of four HPGe detectors (volume $\simeq$ 225 cm^3 each) located in the STELLA facility at the Gran Sasso National Laboratories of INFN. A highly purified sample of Nd_2O_3 (mass 2.38 kg) was measured for 51237 hours, and γ-rays with energies of 334 keV and 406.5 keV, emitted after de-excitation of the 0^+_1 740.5 keV level of ^{150}Sm, were observed in both the one-dimensional and the coincidence spectra. Preliminary, the obtained half-life of ^{150}Nd with respect to the $2\nu2\beta$ decay to the 0^+_1 excited level of ^{150}Sm is $1.1^{+0.5}_{-0.3}(stat)^{+0.2}_{-0.2}(syst) \times 10^{20}$ yr in good agreement with the results of all previous experiments. For the $2\nu2\beta$ and $0\nu2\beta$ transitions of ^{150}Nd and ^{148}Nd to several other excited levels of ^{150}Sm and ^{148}Sm the limits are set at the level of $T_{1/2} > 10^{20} - 10^{21}$ yr.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

DAMA

Is the speaker for that presentation defined?

Yes

Details

Vincenzo Caracciolo

Internet talk

Yes

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