

Investigation of double beta decay of ^{150}Nd to excited states of ^{150}Sm in NEMO-3

Thursday, 23 September 2021 16:55 (25 minutes)

Results of NEMO-3 experiment for double beta decay of ^{150}Nd to the 0_1^+ and 2_1^+ excited states of ^{150}Sm are reported. The data recorded during 5.25 y with 36.6 g of the isotope ^{150}Nd was used in the analysis. For the first time the signal of $2\nu\beta\beta$ transition to the 0_1^+ excited state is detected with statistical significance exceeding 5 sigma. The half-life is measured to be $T_{1/2}^{2\nu\beta\beta}(0_{gs}^+ \rightarrow 0_1^+) = [1.11_{-0.14}^{+0.19} \text{ (stat)}_{-0.15}^{+0.17} \text{ (syst)}] \times 10^{20} \text{ y}$. Limits on $2\nu\beta\beta$ decay to 2_1^+ level and on $0\nu\beta\beta$ decay to 0_1^+ and 2_1^+ levels of ^{150}Sm are estimated since no evidence was found for the signal of corresponding transitions.

Primary author: TRETAK, Victor (Joint Institute for Nuclear Research)

Co-author: ON BEHALF OF NEMO-3 COLLABORATION

Presenters: TRETAK, Victor (Joint Institute for Nuclear Research); ON BEHALF OF NEMO-3 COLLABORATION

Session Classification: Section 5. Neutrino physics and astrophysics

Track Classification: Section 5. Neutrino physics and astrophysics.