

# Measurement of the two neutrino double beta decay half-life of Zr-96 with the NEMO-3 detector

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Abstract: Using 9.4 g of  $^{96}\text{Zr}$  isotope and 1221 days of data from the NEMO-3 detector corresponding to 0.031 kg y, the obtained  $2\nu\beta\beta$  decay half-life measurement is  $T_{1/22\nu}=[2.35\pm 0.14(\text{stat})\pm 0.16(\text{syst})]\times 10^{19}$  yr. Different characteristics of the final state electrons have been studied, such as the energy sum, individual electron energy, and angular distribution. The  $2\nu$  nuclear matrix element is extracted using the measured  $2\nu\beta\beta$  half-life and is  $M_{2\nu}=0.049\pm 0.002$ . Constraints on  $0\nu\beta\beta$  decay have also been set. © 2010 Elsevier B.V. Author Keywords: Deduced; Measured; NEMO-3 detector; Radioactivity

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