



LNGS SEMINARS

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Search for long-lived superheavy ekatungsten with $^{116}\text{CdWO}_4$ crystal scintillator

Abstract

The Aurora experiment at the underground (3600 m w.e.) Laboratori Nazionali del Gran Sasso (INFN, Italy) investigated double beta decay of ^{116}Cd with the help of 1.16-kg cadmium tungstate crystal scintillators enriched in ^{116}Cd to 82% ($^{116}\text{CdWO}_4$). The half-life of ^{116}Cd relative to the $2\nu 2\beta$ decay to the ground state of ^{116}Sn was measured with the highest up-to-date accuracy as $T_{1/2} = 2.63^{+0.11}_{-0.12} \times 10^{19}$ yr. A new limit on the $0\nu 2\beta$ decay of ^{116}Cd to the ground state of ^{116}Sn was set as $T_{1/2} \geq 2.2 \times 10^{23}$ yr at 90% C.L., which is the most stringent known restriction for this isotope. The data collected with highly radiopure $^{116}\text{CdWO}_4$ crystal scintillators during 26831 h was decided to be also used for a search of long-lived superheavy ekatungsten at the high energy part of the measured α spectrum. The limit obtained in these measurements is in agreement with those obtained in recent experiments which instead look for spontaneous fission of superheavy elements or use the accelerator mass spectrometry.

July 19, 2019 - h 11:00 am

LNGS - "B. Pontecorvo" room

https://agenda.infn.it/e/polischuk_2019