



Contribution ID : 140

Type : Oral talk

## **Preliminary results of the new precision measurements of $^{71}\text{Ge}$ lifetime purposed for a solution of "gallium anomaly" problem.**

*Wednesday, 23 October 2024 11:00 (15)*

The possibility of active neutrinos oscillation into the sterile neutrinos is one of the most discussed topics of neutrino physics nowadays. Experimental evidences favoring for the oscillations were obtained from radiochemical gallium-germanium (Ga-Ge) experiments SAGE, GALLEX/GNO and BEST. Especially the latest data from BEST experiment have revealed convincingly, at the level of  $5\sigma$ , a 20% deficit of the neutrinos detected from an artificial neutrino source – the effect called as "gallium anomaly". This deficit of the neutrinos was established, in particular, by taking into the calculations the half-life value of  $^{71}\text{Ge}$  radionuclide. Meanwhile, the half-life value of  $^{71}\text{Ge}$ , which is considered to be relevant at present days ( $T_{1/2}=11.43$  days), was obtained in 1985 and this value diverges significantly (up to  $\sim 10\sigma$ ) from the results of earlier measurements performed in 1950s. By application in the calculations the somewhat greater  $^{71}\text{Ge}$  half-life value than the accepted one, the gallium anomaly can be eliminated or its statistical reliability can be significantly reduced. The aim of the presented work is to verify the validity of  $^{71}\text{Ge}$  half-life value determined previously. The  $^{71}\text{Ge}$  isotope was obtained by the irradiation of natural germanium wafer in the neutron beam of PNPI accelerator. Spectra of  $^{71}\text{Ge}$  were measured with several Si and Ge detectors during with the exposure periode over six months. More details about the measurement procedure and the obtained experimental results will be presented at the Conference.

**Primary author(s) :** DERBIN, Alexander (Petersburg Nuclear Physics Institute); Dr. DRACHNEV, Iliia (PNPI NRC KI); Mr. IVANOV, Denis (Konstantinov Petersburg Nuclear Physic Institute NRC "Kurchatov Institute", Gatchina, Russia); MURATOVA, Valentina (Petersburg Nuclear Physics Institute NRC KI); SEMENOV, Dmitriy; TRUSHIN, Maxim (PNPI); UNZHAKOV, Evgeniy (Petersburg Nuclear Physics Institute)

**Presenter(s) :** TRUSHIN, Maxim (PNPI)

**Session Classification :** Neutrino

**Track Classification :** Neutrino physics