SnT 2023
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE
HOFBURG PALACE - Vienna and Online
19 TO 23 JUNE

Further Improvement and Testing of a Prototype for the Measurement of a Liquid Argon Scintillation

Sergei Pakhomov, Tatiana Kuzmina, Ekateryna Kurysheva, Gennady Shakhetov
V.G. Khlopin Radium Institute, St. Petersburg, Russia

lightning Talks
P3.3_563

Ar-37 is a relevant radionuclide for the CTBTO On-Site Inspection therefore the development of new equipment and methods for its measuring at the background level is very urgent.

For a number of years the Khlopin Radium Institute has been developing under contract with CTBTO a new detection system based on registration of own scintillations of liquefied argon samples containing argon-37. Testing of the developed prototype of measuring system revealed insufficient sensitivity due to low registration efficiency and high background.

To eliminate the identified shortcomings the following work was carried out:

- Optimization of the geometry of the measuring chamber;
- Making of a light guide;
- Carrying out experiments with a model source based on tritium in order to confirm the improvement in light collection;
- Optimization of the technology for applying the wavelength shifting coating;
- Improvement of the computer program in order to provide pulse shape discrimination;
- Purchase of a laboratory system for argon purification up to grade 6.0;
- Carrying out model experiments using ^{55}Fe and ^{238}Pu in order to check the purity of the gas;
- Find the ways to reduce the background.

If you want to learn more about this, come see my e-poster during session P3.3 or access it online on the SnT2023 Conference platform!