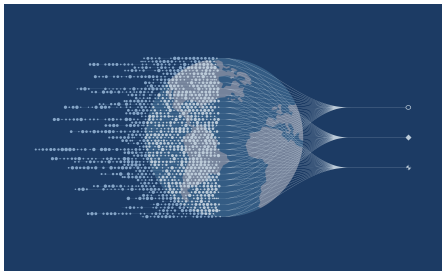

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OF ELECTROLUMINESCENCE IN A PROTOTYPE FOR THE MEASUREMENT OF A LIQUID ARGON SCINTILLATION

The development of equipment for measuring of low levels of argon-37 activity in atmospheric and soil air samples remains a priority task for improving nuclear test monitoring technologies during on-site inspections (OSI), as well as a promising direction for the International Monitoring System (IMS).
In recent years, under a contract with the CTBTO, the Khlopin Radium Institute has been developing a prototype of a setup for measuring low levels of argon-37 activity based on the registration of liquid argon scintillations, a technology traditionally used in particle physics and cosmic rays. Measuring liquid argon samples allows for a significant increase in the volume of argon samples without increasing the size of the measuring cell.
The use of the classical scintillation measurement scheme did not allow reliable registration of argon-37 decays due to the low energy of its Auger electrons. In order to increase the light output, work was started on improving the measuring chamber using the electroluminescence effect and bubble technology. The use of the electroluminescence effect in the prototype for measuring the scintillation of liquid argon allows for a significant improvement in its detection characteristics and thereby ensures measurements of argon-37 activity in atmospheric argon samples at the background level.

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