



Contribution ID : 76

Type : **Poster**

Development of a project for a universal trap for storing ultracold neutrons

Thursday, 24 October 2024 16:30 (30)

The project assumes that in one installation two traps are installed on the same axis: material and magnetic. By rotating the trap system around an axis, it is possible to carry out gravitational capture of UCNs either into a material or into a magnetic trap. Thus, on one installation it is possible to compare the material and magnetic storage of UCNs under the same conditions. It is also important to note that these two measurement methods differ methodically: in a material trap, the neutron lifetime is obtained as a result of extrapolation, while in a magnetic trap it is measured directly. Such a measurement scheme will make it possible to get rid of a number of systematic uncertainties in measurements with different traps and is proposed for the first time. The gravitational capture of UCNs in a magnetic trap proposed in the project is a fundamentally new approach that has never been implemented before. Possible systematic effects due to neutron depolarization and the turbine effect in a magnetic trap are considered. The experiment can be carried out on the ultracold neutron source under construction at the PIK reactor. The design of the installation and the plan for its location in the main reactor hall have been developed. The study has been carried out with the support from the Russian Science Foundation, grant no. 23-22-00169, <https://rscf.ru/project/23-22-00169/>.

Primary author(s) : SEREBROV, Anatolii (NRC "Kurchatov Institute" - PNPI); FOMIN, Alexey (NRC "Kurchatov Institute" - PNPI); KLYUSHNIKOV, Georgy (NRC "Kurchatov Institute" - PNPI); Dr. KOPTYUKHOV, Artem (NRC "Kurchatov Institute" - PNPI); MURASHKIN, Alexander (NRC "Kurchatov Institute" - PNPI)

Presenter(s) : FOMIN, Alexey (NRC "Kurchatov Institute" - PNPI)

Session Classification : Poster session

Track Classification : Facilities and advanced detector technologies