31st International Seminar on Interaction of Neutrons with Nuclei: Fundamental Interactions & Neutrons, Nuclear Structure, Ultracold Neutrons, Related Topics (ISINN-31)



Contribution ID: 113

Type: not specified

## Concept of the UCN Source at the WWR-K Reactor (AISUN)

Thursday, 29 May 2025 09:20 (15 minutes)

A concept is presented for an ultracold neutron (UCN) source with a superfluid helium converter placed in the thermal column of the WWR-K research reactor (Almaty, Kazakhstan). Similar source designs are employed in the existing TRIUMF project (Vancouver) [1] and the proposed project at the WWR-M reactor (Gatchina) [2]. The main distinguishing features of our concept are more efficient systems for accumulating UCNs in the source and transporting them to experimental facilities. This is achieved by separating the heat and UCN fluxes from the source, as well as by lowering the temperature of the helium converter below approximately 1 K.

In this work, we build on the parameters of UCN source concepts from existing projects that involve accumulating UCNs in superfluid helium, and we aim to refine these parameters for developing a UCN source at the WWR-K reactor. We perform an assessment of the achievable UCN density both in the source and in the experimental setup. We also discuss the challenges that must be resolved to justify the feasibility of such a project and to achieve the highest possible performance of the source.

## Acknowledgment

This work was carried out with the financial support of the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan as part of the grant-funding program for young scientists under scientific and technical projects No. AP19579042.

## References

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[2] Serebrov A. P., Fomin A.K., Kharitonov A. G. et al. High-Density Ultracold Neutron Sources for the WWR-M and PIK Reactors // Cryst. Rep. 2016. V. 61. P. 144.

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**Session Classification:** Parallel Session 3: Neutron detection & Methodical aspects/Physics of ultracold neutrons

Track Classification: Parallel session: Parallel session 3