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Current Status of Ultracold Neutron Source at the PIK Reactor

The work is devoted to the creation of a new ultracold neutron source based on superfluid helium for researches in the field of physics of fundamental interactions at the PIK reactor. This source is aimed at obtaining a world record UCN density of 2200 cm-3.
For this source we have developed and implemented the whole scope of technologies allowing us to make UCN sources based on superfluid helium: production and maintenance of superfluid helium at low temperature under reactor heat inflows conditions, development of technological complex to maintain its operating parameters, production of UCN neutron guides with high neutron reflection rate, design of heat exchangers for ultra-low temperatures and production of isotope-pure helium-4.
At the first stage of the source operation, it is planned to install a nEDM spectrometer and two neutron lifetime measurement experiments, one with a gravitational and one with a magnetic trap.

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