

On the possibility to create a UCN source on a pulsed reactor

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Over the past years, a number of ultracold neutron (UCN) sources have appeared in the world, and several more of them are under construction. Although UCNs were discovered in Dubna [1], there is still no UCNs source in Dubna. The reasons for this are largely due to the peculiarities of the pulsed IBR-2 reactor of JINR. Its average power of 2 MW is relatively small for creating a continuous UCN source. At the same time, the pulsed flux of thermal neutrons is very large, since the interval between pulses significantly exceeds their duration. Under certain conditions, the pulsed UCN flux from a thin moderator can also be quite significant.

We have presented the concept of an intense UCN source at periodic pulsed reactor. It is shown that the implementation of the principle of time focusing [2], based on nonstationary neutron diffraction, in combination with neutron moderation, as well as the idea of pulsed filling of the UCN trap [3], make it possible to create a sufficiently intense UCN source based on a pulsed reactor with a moderate power.

This seems to be especially relevant in connection with the plans to create a new intense neutron source IBR3 "Neptune" at JINR.

1. *Luschikov V.I., Pokotilovsky Yu.N., Strelkov A.V., Shapiro F.L.*, JETP Lett., **9** (1969) 23.
2. *Frank A. I., Gähler R.*, Proc. of ISINN-4, Dubna (1996) 308; *Frank A. I., Gähler R.*, Phys. At.Nuc., **63** (2000) 545.
3. *Shapiro F. L.*, EChAYa, **2** (1971) 975.