



Contribution ID: 0

Type: Oral

Supersource of ultracold neutrons with superfluid helium at WWR-M reactor

Monday, 16 October 2017 14:35 (35 minutes)

Use of ultracold neutrons (UCN) gives unique opportunities of a research of fundamental interactions in physics of elementary particles. Search of the electric dipole moment of a neutron (EDM) aims to test models of CP violation. Precise measurement of neutron lifetime is extremely important for cosmology and astrophysics. Considerable progress in these questions can be reached due to supersource of ultracold neutrons based on superfluid helium, which is under construction now in PNPI. Our source aims at obtaining a density of UCN equals to 10^{4} n/cm³, two orders of magnitude exceeding that in existing sources presently available in the world. Now the project and basic elements of the source are prepared, full-scale model of the source is tested, the scientific program is developed. Increase in accuracy of neutron EDM measurements by order of magnitude is planned. The most intense source of UCN will allow PNPI become the centre of fundamental researches with UCN.

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Session Classification: MoAf1

Track Classification: Sources of ultra cold neutrons