

SIMULATION OF PRECISE EXPERIMENT OF LOSS COEFFICIENT MEASUREMENT AT DIFFERENT UCN VELOCITIES USING GRAVITATIONAL SPECTROSCOPY.

Wednesday, April 17, 2019 3:15 PM (15 minutes)

Very low energy neutrons ($\approx 10^{-7}$ eV) called ultracold neutrons have a unique property –they can be stored in material or magnetic traps [1]. This gives a new opportunity to carry out experiments to study fundamental physics issues.

Most of UCN experiments are statistically limited. And we are today at a point at which fundamental physics application require larger UCN intensities in order to further advance. But nowadays the intensities of UCN that we have are not enough and require further advance. Thus, most of researches centres are working on increasing of existing UCN sources or on building new intense sources of UCN to develop experiments of neutron measurement and to improve their accuracy. Various developments have allowed one to increase the intensity of UCN considerably over the years. One of them is work, which was provided by FLNP JINR physicists [2]. One of the important parts of this work is storage vessel of UCN, which has to store maximum number of UCN. Consequently, one should note that task of building a UCN production trap from a technologically convenient material with minimum loss coefficient and high optical potential.

This work is devoted to simulation of precise experiment of loss coefficient measurement depending on velocities of UCN with gravitational spectroscopy and to choose optimal parameters of storage volume. The effect of various covers and materials of trap on loss coefficients preliminary was estimated.

Primary author: TURLYBEKULY, Kylyshbek (Turlybekuly)

Co-authors: KEREIBAY, Dias (Kereibay); Mr LYCHAGIN, Egor (FLNP JINR)

Presenter: TURLYBEKULY, Kylyshbek (Turlybekuly)

Session Classification: Nuclear Physics

Track Classification: Nuclear Physics