Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

Development of UCN rebuncher for nEDM experiments with pulsed sources SOHEI IMAJO, Department of Physics, Kyoto University, YOSHIHISA IWASHITA, ICR, Kyoto University, MASAAKI KITAGUCHI, HIROHIKO M. SHIMIZU, Department of Physics, Nagoya University, KENJI MISHIMA, ICEPP, University of Tokyo, TAKASHI INO, KEK, RYUUNOSUKE KITAHARA, ICR, Kyoto University, NEUTRON OPTICS AND PHYSICS COLLABORATION
— We are planning to construct a spallation ultracold neutron (UCN) source and carry out the searches of the neutron electric dipole moment at J-PARC. It produces high-density pulsed UCNs. However, UCNs are diffused in guide tubes during long-range transport. In order to focus UCNs on the experimental bottle, we have developed a neutron accelerator named "UCN rebuncher." This apparatus consists of a large electromagnet and a resonance spin flipper. The kinetic energy of neutron changes when it flies into static magnetic field and the change is retained due to spin-flip in the field. By accelerating slower neutrons or decelerating faster neutrons suitably this apparatus controls the diffusion of UCNs. We succeeded in the proof-of-principle experiment of the first rebuncher in 2011. It can change the kinetic energy in the range from 72 neV to 118 neV. At present we are developing the second rebuncher in order to increase the controllable range of kinetic energy by two times. It will be able to change the kinetic energy in the range from 33 neV to 124 neV.

Sohei Imajo
Department of Physics, Kyoto University

Date submitted: 02 Jul 2014 Electronic form version 1.4