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Measurement of UCN Energy Spectrum of He-II Spallation UCN source RYOHEI MATSUMIYA, Dept. of Phys., Osaka University, Y. MASUDA, S. JEONG, Y. WATANABE, IPNS, KEK, K. HATANAKA, RCNP, Osaka Univ., K. MATSUTA, D. NISHIMURA, M. MIHARA, T. SAKURAI, Osaka Univ., T. YOSHIOKA, H. HANO, T. SUEHIRO, Y. HISAMATSU, H. OIDE, H. OTONO, S. YAMASHITA, ICEPP, Univ. of Tokyo, A. HOLLEY, E. KOROBKINA, G. PALMQUIST, R. GOLUB, North Carolina State Univ. — Ultra cold neutron (UCN) is a very low energy neutron (∼200neV), which can be confined in a material bottle. UCN can be used for experiments on fundamental physics such as precise measurements of neutron EDM. A higher intensity UCN source is required to do such precise measurements. We have developed a He-II spallation UCN source at RCNP, Osaka Univ.. In this source, fast neutrons obtained by spallation reactions are moderated by RT D_2O and 10K solid D_2O, then scattered by phonons in superfluid helium (He-II) to be UCN. The obtained UCN density was 15 UCN/cm^3. We measured the energy spectrum of UCN at the exit of this source by storing them in a cylindrical bottle in order to understand the performance of this source. A polyethylene disk installed at the height h in this bottle absorbs UCN with energy larger than mgh. The UCN energy spectrum was deduced by differentiating the UCN counts detected as a function of the disk height h. The obtained spectrum is well reproduced by the Monte Carlo simulation.

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