Contribution ID: **33** Type: **Talk**

High energy mono-energetic and white neutron sources in RCNP, University of Osaka

Monday 7 July 2025 11:15 (15 minutes)

High energy (above ~100 MeV) neutron beams offer unique opportunities to perform e
xperiments in the fields from fundamental physics such as nuclear physics and particle physics to applied science such as studying performances of detectors and shielding materials for high-energy neutrons, soft errors of semiconductor devices, and space engineering. Research Center for Nuclear Physics (RCNP) in University of Osaka provides two types of high-energy pulsed neutron beams, one is produced via the 7Li(p,n)7Be reaction and another generated via the spallation reaction with a tungsten target, both are driven by the primary proton beams provided by the K=400 RCNP ring-cyclotron. The monoenergetic neutron beam covers the energy range from ~5 MeV up to 390 MeV, and thanks to TOF (time-of-flight) tunnel with a 100 m-long flight path, the energy resolution is as good as 2.9MeV (FWHM) at the neutron energy of 387 MeV. The neutron intensity of the monoenergetic component is typically ~1010 neutrons/sr/⊠C at 387 MeV [1]. The white neutron source has an energy distribution very similar to that of atmospheric neutrons produced by cosmic-rays [2] and is useful to test soft errors of semiconductor devices or highly integrated electric circuits due to cosmic neutrons. In this paper the specifications of those neutron sources and previous works with use of them will be presented. The recent results of the operation and information for users will be also mentioned.
References:
[1] Y. Iwamoto et al., Nuclear Instruments and Methods in Physics Research, A629, 43-49 (2011).
[2] Y. Iwamoto et al., Nuclear Technology, Vol.173, pp.210-217 (2011).

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Session Classification: Accelerator Facilities 1

Track Classification: Day 1: Health and Radiation Protection; Science and Technology: Accelerator Facilities 1