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Fast neutron TOF facility at RAON

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A fast neutron facility, called NDPS (Nuclear Data Production System), has been constructed for nuclear science and applications at RAON (Rare Isotope Accelerator complex for ON-line experiments) in Korea. The installation of NDPS and transport beamline from SuperConducting LINAC 3 (SCL3) to NDPS was finished in 2022. The NDPS is designed to provide both white and mono-energetic neutrons, using 98 MeV deuteron and 20 –83 MeV proton beams with a thick graphite and thin lithium targets, respectively. The energy of the neutron is determined by employing the time-of-flight (TOF) technique, along with a pulsed deuteron (or proton) beam with a repetition rate of less than 200 kHz. Fast neutrons are produced in the target room and are guided to the TOF room through a 4 m long neutron collimator consisting of iron and 5 % borated polyethylene. In the TOF room, a gas-filled Parallel Plate Avalanche Counter (PPAC) will measure the neutron arrival time and position as it has a neutron converter of a thin ^{232}Th layer. Additionally, EJ-301 liquid scintillation detectors will be used for the measurement of neutron flux with pulse shape discrimination capability. The beam commissioning for NDPS is scheduled for 2024 with a proton beam. The present status of NDPS will be reported, together with our future plan.

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Footnotes

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