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Benchmarking of Neutron Radiation Effects Facility (NREF) at LENS for Neutron Science Facility (NSF) at the Future Heavy-Ion Accelerator in Korea

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LENS is a novel, long pulsed neutron source located in the Center for Exploration of Energy and Matter (CEEM) of Indiana University and RAON is a heavy-ion accelerator complex that is being constructed in Korea. NREF at LENS utilizes a low energy p-N reaction between Beryllium target and a high-current, variable-pulse-width proton beam to produce Quasi monochromatic high flux neutron beams with the energy up to ~10 MeV while higher energy neutrons are produced in NSF at RAON from the light target such as C and Li by either ~88 MeV protons or ~53 MeV deuteron beams. Because of high neutron fluence at NSF, detailed estimation for prompt radiation and induced activation is important in designing the facility. Simulation results using MCNPX, and PHITS codes are presented to survey and validate the capability of the designed facility with benchmarking of NREF for NSF. Comprehensive comparisons of two facilities and future possibilities of NSF will be discussed.

Primary author: LEE, Sangjin (Institute for Basic Science)

Co-authors: KIM, Jae Cheon (Institute for Basic Science); Dr LEE, Jae-Seong (Radiation Sources Licensing, Korea Institute of Nuclear Safety; College of Medical Science, Konyang University); NAM, Shinwoo (Institute for Basic Science); CHUNG, Yeon Sei (Institute for Basic Science)

Presenter: LEE, Sangjin (Institute for Basic Science)

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