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A Plan of Proton Irradiation Facility at J-PARC and Possibilities of Application to Nuclear Data Research
J-PARC における陽子照射施設計画と核データ研究への応用への可能性

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The partitioning and transmutation (P-T) technology has promising potential for volume reduction and mitigation of degree of harmfulness of high-level radioactive waste. JAEA is developing the P-T technology combined with accelerator driven systems (ADS) [1]. One of critical issues affecting the feasibility of ADS is the proton beam window (PBW) which functions as a boundary between the accelerator and the sub-critical reactor core. The PBW is damaged by a high-intensity proton beam and spallation neutrons produced in the target, and also by flowing high-temperature liquid lead bismuth eutectic alloy which is corrosive to steel materials. To study the materials damage under the ADS environment, J-PARC is proposing a plan of proton irradiation facility which equips with a liquid lead-bismuth spallation target bombarded by a 400 MeV –250 kW proton beam. The facility is also open for versatile purposes such as soft error testing of semi-conductor devises, RI production, materials irradiation for fission and fusion reactors, and so on. Application to nuclear data research with using the proton beam and spallation neutrons is also one of such versatile purposes, and we welcome unique ideas from the nuclear data community.

[1] T. Sugawara, et al., "Research and development activities for accelerator-driven system in JAEA,"Prog. Nucl. Energy, 106, pp. 27–33 (2018).

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