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The Radiation Damage Calculation and Possibility of Irradiation Simulation Experiment of the Beam Window Used for Accelerator-Driven Transmutation System

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Abstract

HYPER (**HY**brid **P**ower **E**xtraction **R**eactor) is the accelerator-driven transmutation reactor developed by KAERI. Pb-Bi is used as the coolant and target material for HYPER. HYPER adopts 1 GeV, 20 mA proton beam and beam window is exposed to that proton beam and neutrons produced by protons. We select low activation martensitic/ferritic steel such as 9Cr-2WVTa as the beam window material. It is essential to know the radiation damage of the beam window for window design and lifetime prediction. We calculate ***dpa*** (displacement per atom) due to protons and neutrons. We also calculate He production. Then Fe and He ion implantation experiment is discussed for irradiation simulation experiment.