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Study of Dislocation Loops in Ion-Irradiated Tungsten Using X-Ray Diffuse Scattering[1] PEIHAO SUN, High Energy Density Science Division,SLAC National Accelerator Laboratory; Department of Physics, Stanford University, PHILIP HEIMANN, SLAC National Accelerator Laboratory, YONGQIANG WANG, Los Alamos National Laboratory, MUNGO FROST, High Energy Density Science Division,SLAC National Accelerator Laboratory, CHRISTOPHER SCHONWALDER, High Energy Density Science Division,SLAC National Accelerator Laboratory; Friedrich-Alexander University, ABRAHAM LEVITAN, MIANZHEN MO, ZHIJIANG CHEN, High Energy Density Science Division,SLAC National Accelerator Laboratory, JEROME HASTINGS, SLAC National Accelerator Laboratory, SIEGFRIED GLENZER, High Energy Density Science Division,SLAC National Accelerator Laboratory — As the material of choice for the divertor wall in tokamak fusion reactors, tungsten is exposed to high levels of radiation. As a result, a large amount of defects form inside the crystal, leading to significant changes in its thermal-mechanical properties. Therefore, it is important to understand the types and sizes of radiation-induces defects. X-ray diffuse scattering around Bragg peaks has been developed as a technique to solve this problem. By applying this technique to ion-irradiated tungsten, we have obtained quantitative data on the size-distribution of dislocation loops under different radiation levels.

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