

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Analysis of Tungsten Ion Transport in Rotating Tokamak Plasmas by Orbit Calculation¹ TAKA AKI FUJITA, KEISUKE MATSUURA, KYOHEI KOBAYASHI, ATSUSHI OKAMOTO, Nagoya University, KAZUO HOSHINO, Keio University, NOBUHIKO HAYASHI, MITSURU HONDA, TOMOHIDE NAKANO, National institutes for Quantum and Radiological Science and Technology — To explain the increase in the accumulation of tungsten in case of the toroidal rotation opposite to the plasma current, which was observed in the JT-60U experiment, analytical models of the PHZ (inward pinch of high-Z impurity due to atomic processes) and the pinch due to the radial electric field E_r through Coulomb collision were proposed. In the analysis of the JT-60U experiment, it was found that the experimental conditions did not satisfy assumptions of the original E_r pinch. Furthermore, trapped particles were not considered in the original models. In order to overcome these shortcomings of the models, we developed a code to calculate the guiding center orbit of an impurity ion and evaluate the PHZ pinch and the E_r pinch in rotating tokamak plasma. In the analysis of the JT-60U experiment, a positive dependence of the tungsten accumulation on the counter toroidal rotation was obtained. The tungsten accumulation was larger compared to the previous analysis using analytical pinch models for the large toroidal rotation cases.

¹This study was supported by the Collaboration Research Programme of Joint Special Design Team for Fusion DEMO in Japan and by the Tokamak Plasma Collaboration Research Programme in National institutes for Quantum and Radiological Science and Technology.

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Date submitted: 02 Jul 2019

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