

Abstract Submitted
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Measurement of limiter particle fluxes and carbon erosion in the helical scrape-off layer of startup plasmas at W7-X¹ V. WINTERS, UW Madison, C. BIEDERMANN, IPP Greifswald, Germany, S. BREZINSEK, Forschungszentrum Juelich GmbH, F. EFFENBERG, H. FRERICHS, UW Madison, J. HARRIS, Oak Ridge National Lab, O. SCHMITZ, L. STEPHEY, UW Madison, E. UNTERBERG, Oak Ridge National Lab, G. WURDEN, Los Alamos National Lab, W7-X TEAM — Measurement of the 2D recycling flux and calculations of the carbon erosion from the limiter in startup plasmas of W7-X provides a first insight into neutral particle release and impurity inflow into the helical scrape-off layer. H-alpha, C-II (514.5nm) and C-III (465.1nm) line emissions were collected with filter-scopes and a visible camera aimed at limiter 3 of W7-X. Local plasma parameters are considered to estimate physical and chemical sputtering contributions. The analytical model for chemical sputtering by Roth is used to convert the measured particle flux into a chemically eroded C flux. The particle flux as well as the extracted C erosion pattern deviates from the measured heat flux distribution and also from the predicted particle flux distribution from EMC3-EIRENE. Candidates to resolve this discrepancy are measurement uncertainties and physics related (e.g. asymmetry in the last closed flux surface position). Post-mortem analysis of the limiter will be taken into account and compared to these in-situ measurements to gather first detailed insight on the net C erosion distribution and the impurity sourcing into the helical scrape-off layer.

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