

Abstract Submitted
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Synthetic reconstruction of recycling on the limiter during startup phase of W7-X based on EMC3-EIRENE simulations¹ HEINKE FRERICHs, FLORIAN EFFENBERG, OLIVER SCHMITZ, LAURIE STEPHEY, University of Wisconsin, Madison, W7-X TEAM — Interpretation of spectroscopic measurements in the edge region of high-temperature plasmas can be a challenge due to line of sight integration effects. The EMC3-EIRENE code - a 3D fluid edge plasma and kinetic neutral gas transport code - is a suitable tool for full 3D reconstruction of such signals. A versatile synthetic diagnostic module has been developed recently which allows the realistic three dimensional setup of various plasma edge diagnostics to be captured. We present an analysis of recycling on the inboard limiter of W7-X during its startup phase in terms of a synthetic camera for H_α light observations and reconstruct the particle flux from these synthetic images based on ionization per photon coefficients (S/XB). We find that line of sight integration effects can lead to misinterpretation of data (redistribution of particle flux due to neutral gas diffusion), and that local plasma effects are important for the correct treatment of photon emissions.

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