

Abstract Submitted
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Impurity Transport Experiments at the HSX Stellarator with Laser Blow-Off Injections¹ J.F. CASTILLO, B. GEIGER, A. BADER, S.T.A. KUMAR, K.M. LIKIN, D.T. ANDERSON, F.S.B. ANDERSON, J.N. TALMADGE, University of Wisconsin - Madison, HSX PLASMA LAB, UNIVERSITY OF WISCONSIN - MADISON TEAM — The laser blow-off technique is used to inject aluminum atoms into the confined region of HSX. To study the radial propagation and confinement properties of the injected impurities, signals from several arrays of AXUV diodes are evaluated and compared with modeling results from the impurity transport code STRAHL. Initial results from hydrogen plasmas featuring electron densities in the range of $3 \times 10^{12} \text{ cm}^{-3}$ and temperatures of up to 1.2 keV demonstrate centrally peaked emissivity profiles. The rapid appearance of core localized emissions after injections agrees with STRAHL modeling when assuming values of anomalous diffusion well above the neoclassical level. A sensitivity study shows that the uncertainties in the background neutral density and the scrape-off layer loss time make detailed studies of anomalous diffusion profiles challenging. However, studies of the dependence of the impurity confinement (τ) on the absorbed ECH power (P) exhibit a $\tau \sim P^{-1}$ scaling, similar to the ISS04 scaling, suggesting a substantial impact of turbulence on the impurity confinement in HSX.

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