

Abstract Submitted
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Neutral Density Profiles in the HSX Stellarator¹ ZANDER KEITH, SANTHOSH KUMAR, BENEDIKT GEIGER, AARON BADER, DAVID ANDERSON, University of Wisconsin - Madison — Neutral density distribution in HSX plasma is calculated using the 3D Monte-Carlo neutral particle code, DEGAS. Calculated neutral density is then scaled with poloidal and toroidal H-alpha measurements to obtain a radial profile of averaged neutral densities in the plasma. Calculations are done for the quasi-helically symmetric and symmetry degraded configurations of HSX, for various plasma and wall conditions. The scaling factor obtained from present and previous experiments (with core electron temperature $\sim 1.5\text{keV}$ and plasma density $\sim 3 \times 10^{18}/\text{m}^3$) is used to scale neutral density profiles from simulations of the HSX upgrade, where higher plasma density ($\sim 2 \times 10^{19}/\text{m}^3$) is expected. Initial results show a significant reduction (about a factor of 4) in the neutral hydrogen density for the HSX upgrade parameters.

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