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Impurity Mixing Due to MHD in MGI Simulations of DIII-D¹ V.A. IZZO, University of California-San Diego — Simulations of massive gas injection (MGI) into DIII-D are performed with the NIMROD code. An impurity source that is strongly localized to the edge is used to initiate the simulated MGI shutdown, based on observations that gas jets do not penetrate deeply into the plasma. When the neutral impurity source is poloidally symmetric, it is found that the distribution of impurity ions does not remain poloidally symmetric as the ions diffuse toward the core; instead 2D flows tend to concentrate the impurities on the low-field-side (LFS). Later, 3D flows associated with an m=1/n=1 MHD instability, efficiently mix the impurities into the core, causing a rapid increase in the central electron density simultaneous with a rapid decrease in the central temperature. Further simulations are carried out in which the impurity source is concentrated only on the LFS or the high-field-side (HFS). The effects of varying the poloidal impurity distribution on the efficiency of the MHD mixing are investigated.

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