Impurity mixing and radiation asymmetry in massive gas injection simulations of DIII-D

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Abstract. Simulations of neon massive gas injection into DIII-D are performed with the 3D MHD code NIMROD. The poloidal and toroidal distribution of the impurity source is varied. This report will focus on the effects of the source variation on impurity mixing and radiated power asymmetry. Even toroidally symmetric impurity injection is found to produce asymmetric radiated power due to asymmetric convective heat flux produced by the 1/1 mode. When the gas source is toroidally localized, the phase relationship between the mode and the source location is important, affecting both radiation peaking and impurity mixing. Under certain circumstances, a single, localized gas jet could produce better radiation symmetry during the disruption thermal quench than evenly distributed impurities.

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