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Edge impurity transport in the presence of magnetic islands with EMC3-EIRENE[1] A. BADER, O. SCHMITZ, UW-Madison, M. KOBAYASHI, NIFS, Japan, F. EFFENBERG, C.C. HEGNA, UW-Madison, K. IDA, M. YOSHINUMA, NIFS, Japan, Y. FENG, IPP-Greifswald, Germany — Control of edge impurities is a crucial area of research for next generation reactors. These devices require the limitation of impurity accumulation in the core plasma, exhaust of helium ash, and possibly isotropic heat flux distribution via impurity radiation. Simple transport of impurities involves a competition between the plasma friction force and the thermal gradient. The presence of magnetic islands complicates behavior and can lead to impurity accumulation in edge regions while avoiding core contamination in some configurations. Experimental results on LHD have shown differences in helium transport with the introduction of an edge 1/1 island. We present simulations of helium data with the fluid edge code EMC3-EIRENE and compare to spectroscopic measurements from LHD. In addition we show simulation data from alternative magnetic configurations based on the HSX coil system with large edge islands, focusing on the evolution of impurity radiation profiles as a function of plasma density.

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