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Modeling of Impurity Spectroscopy in the DIII–D Divertor,[1] W.P. WEST, N.H. BROOKS, General Atomics, S.L. ALLEN, G.D. PORTER, R.D. WOOD, Lawrence Livermore National Laboratory, R.C. ISLER, M.R. WADE, Oak Ridge National Laboratory, G.R. MCKEE, Oak Ridge Institute for Science Education, D.G. WHYTE, INRS–Energie et Materiaux — The transport of impurities in the divertor and scrape-off-layer of DIII–D has been modeled using the 1D multifluid code NEWT1D and the multifluid version of the 2D code UEDGE. The modeled plasmas have been experimentally characterized using the extensive DIII–D divertor diagnostic set, along with X–point sweeping, to give a 2D picture of electron density and temperature, as well as detailed data on impurity line emission in both the visible and VUV region of the spectrum. Matching this extensive plasma data set with the modeling codes provides confidence that the primary plasma paramerters are accurately represented by the modeling, and comparisons to the spectroscopic data provides important information on the impurity source distributions, the ionization state distributions, and indirectly on the impurity ion transport. Modeling of carbon line emission reveals that sputtering alone cannot account for the core plasma content of carbon, nor for the observed distributions of carbon line emission. The measurements are matched much better by a distributed source.

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