

3D-DIVIMP(HC) code modeling of DIII-D DiMES porous plug injector experiments

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Abstract

A Porous Plug Injector (PPI) system for the Divertor Material Evaluation System (DiMES) on DIII-D has been employed for *in situ* study of chemical erosion in the tokamak divertor environment. The 3D-DIVIMP(HC) code has been applied to the interpretation of the CI, CII and other spectroscopic measurements made at the PPI location, for (a) the synthetic source due to injection of CH₄ through the PPI, and (b) the natural emission from the PPI head itself, which was inserted above surrounding graphite tiles by ~ 0.3 mm.

The code successfully replicated the MDS (spectrometer)-measured absolute emissions of CH, CI, CII 427 nm, 514 nm, and 658 nm and the DiMES TV-measured spatial shapes of the CH, CI, and CII 514 nm emission “clouds” to within the combined uncertainties. It is thus concluded that the most important physics and chemistry of chemical sputtering have most likely been included in the model.

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