

Abstract Submitted
for the DPP02 Meeting of
The American Physical Society

Sorting Category: 5.6.2 (Experimental)

**Distinguishing Physical and Chemical Sputtering in
the DIII-D Divertor by Analysis of C I Lineshapes¹**

N.H. BROOKS, General Atomics, R.C. ISLER, ORNL — Physical and chemical sputtering are the dominant mechanisms for release of carbon into the DIII-D divertor [1]. Detailed analysis of C I line profiles, in combination with influx measurements for CD, C₂ and C I, permit distinguishing the relative contribution each of the two sputtering processes makes to the total influx of neutral carbon during a discharge. On close examination, the C I line profiles are seen to be asymmetric, with their peaks shifted to the blue relative to their nominal wavelengths. Profiles synthesized from the convolution of the spectrometer instrument function with model calculations of the Thompson velocity distribution for sputtered carbon atoms are used to guide decomposition of the measured C I profiles into separate components associated with physical and chemical sputtering. The method requires a good wavelength fiducial on all tracks of the CCD camera in the multi-chord divertor spectrometer system.

[1] Isler, et al., Proc. 15th Int. Conf. on Plasma Surface Interactions in Control. Fusion Devices, to be published.

¹Work supported by US DOE Contract Nos. DE-AC03-99ER54463 and DE-AC05-00OR22725.

Prefer Oral Session
Prefer Poster Session

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Special instructions: Poster 19, Edge/Divertor/Transport

Date submitted: July 19, 2002

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