Abstract Submitted for the Twelfth Topical Conference on High Temperature Plasma Diagnostics June 7–11, 19987, Princeton, New Jersey

Category Number and Subject:

[ ] Theory [**x**] Experiment

Argon K_α Measurement on DIII–D by Ross Filters Technique,* R.T. Snider, I.N. Bogatu,† N.H. Brooks, M.R. Wade,‡ *General Atomics* — Techniques to reduce the heat flux to the divertor plates in tokamak power plants and the consequent erosion of, and subsequent damage to the divertor target plates include the injection of impurities such as Argon, that can dissipate the energy (through radiative or collisional processes) before it reaches the target plates. An important issue with this type of scheme is poisoning of the plasma core by the impurities introduced in the divertor region. Subsequently there is a desire to measure the profiles of the injected impurities in the core. X–ray Ross filters with an effective narrow band pass centered on the argon K_α line at 3.2 keV, have been installed on two of the existing X–ray arrays on DIII–D in order to help determine the argon concentration profiles. Emissivity profiles of the K_α lines and the emissivity profiles for the Argon enhanced continuum can be inferred from the inverted filtered X–ray brightness signals if T_e, n_e and Ar^{18+} profiles are known. The MIST[1] code is used to couple the filtered X–ray signals to the time dependent measurements of T_e, and n_e. Further, the Ar^{16+} profiles measured by charge transfer spectroscopy, are used as a constraint on the MIST code runs to calculate Ar^{18+} profiles and unfold the argon emissivity profiles. A discussion of the Ross filters, the DIII–D argon data and the data analysis scheme for inferring argon emissivity profiles will be discussed. Estimates of the total argon concentration in the core determined from this technique in DIII–D argon puff experiments will be presented.

---

*Work supported by U.S. Department of Energy under Contracts DE-AC03-89ER51114 and DE-AC05-96OR22464. †National Institute for Lasers, Plasma, and Radiation Physics, Romania.

[1]R.A. Hulse, Nucl. Technol. Fusion **3** (1983) 259.

[**x**] Prefer Poster Session

[ ] Prefer Oral Session

[ ] No Preference

[ ] This poster/oral should be placed in the following grouping: (specify order)

[ ] Special Facilities Requested (e.g., movie projector)
_____
_____

[ ] Other Special Requests
_____
_____

Submitted by:

_____
(Signature of APS member)

R.T. Snider
(Same Name Typewritten)

General Atomics
P.O. Box 85608
San Diego, CA 92186-5608
(Address)

(619)455-2192/(619)455-4156
Phone/Fax

snider@gav.gat.com
Email Address