Abstract Submitted for the Twelfth Topical Conference on Radio Frequency Power in Plasmas April 1–3, 1997, Savannah, Georgia

Category Number and Subject:

[ ] Theory [x] Experiment

An ELM-Resilient RF Arc Detection System for DIII–D Based on Electromagnetic and Sound Emissions from the Arc,* D.A. Phelps, *General Atomics* — To maximize the rf power and energy coupled to ELMing H–mode in DIII–D the transmitter must be shut-off for the minimum required clear time only after arcs and must be reduced only as appropriate during ELMs. To meet this need, we are studying two detection methods based solely on sound and electromagnetic emissions from the arc: (1) Arc sound does not emanate from the vacuum vessel. This means arc sound can be used to reduce the rate of pulsing if the arc is occurring in the external rf system. We observe clear evidence of where in the system an arc is occurring. (2) Arc electromagnetic noise in the 8–12 MHz range is not significantly attenuated by ohmic loss in the transmission line. This range was selected to reject lower frequency switching transients and higher frequency power at the transmitter frequency. There is no observed change in the threshold noise level during ELMs. Furthermore, arc noise spikes 40 to 60 dB above the trace background noise are observed. These spikes correlate in real time with tripping due to an increase in the rf reflection coefficient.

*Work supported iby U.S. Department of Energy under Contract DE-AC03-89ER51114.

[ ] Prefer Poster Session

[x] 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)

David A. Phelps
(Same Name Typewritten)

General Atomics
P.O. Box 85608
San Diego, CA 92186-9784
(Address)

(619)455-2385/(619)455-2838
Phone/Fax

phelpsd@gat.gav.com
Email Address