

Abstract Submitted
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Sorting Category: 5.1.1.2 (Theoretical)

Analysis of DIII-D Density Limits¹ W.M. STACEY,
Georgia Institute of Technology, M.A. MAHDAVI, General Atomics,
R. MAINGI, Oak Ridge National Laboratory — A variety of theoretical
and computational models are being applied to interpret recent experi-
mental data on density limits observed in the DIII-D tokamak. Theoret-
ical models for the limiting densities at which the core plasma becomes
unstable against radiative collapse of the radial temperature profile^{2,3} or
for which the uniform edge plasma becomes thermally unstable against
the onset of MARFEs⁴ are being used to examine the role of thermal in-
stabilities in producing the observed density limits. The possibility that
the limiting densities correspond to limitations on the divertor power
balance solution are being investigated by solving a coupled divertor
plasma-recycling neutrals-core plasma model⁵ for the limiting experi-
mental conditions.

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DE-AC03-89ER51114.

²W. M. Stacey, *Phys. Plasmas* **4** (1997) 1069.

³M.A. Mahdavi *et al.*, “*Stability of a Radiative Mantle in ITER*,”
preprint (1998).

⁴W.M. Stacey, *Phys. Plasmas* **3** (1996) 2673.

⁵W.M. Stacey, *Phys. Plasmas* **5** (1998) 1015.

Prefer Oral Session
 Prefer Poster Session

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Special instructions: DIII-D Oral Session II, immediately following Maingi

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