

## **Suppression of large edge localized modes in high confinement DIII–D plasmas with a stochastic magnetic boundary**

T.E. Evans, R.A. Moyer,<sup>1</sup> P.R. Thomas,<sup>2</sup> J.G. Watkins,<sup>3</sup> T.H. Osborne,  
J.A. Boedo,<sup>1</sup> M.E. Fenstermacher,<sup>4</sup> K.H. Finken,<sup>5</sup> R.J. Groebner, M. Groth,<sup>4</sup>  
J.H. Harris,<sup>6</sup> R.J. La Haye, C.J. Lasnier,<sup>4</sup> S. Masuzaki,<sup>7</sup> N. Ohyaabu,<sup>7</sup>  
D.G. Pretty,<sup>6</sup> T.L. Rhodes,<sup>8</sup> H. Reimerdes,<sup>9</sup> D.L. Rudakov,<sup>1</sup>  
M.J. Schaffer, G. Wang,<sup>8</sup> and L. Zeng<sup>8</sup>

General Atomics, San Diego, California, U.S.A. 92186

<sup>1</sup>University of California San Diego, La Jolla, California, U.S.A.

<sup>2</sup>CEA Cadarache Euratom Association, Cadarache, France

<sup>3</sup>Sandia National Laboratory, Albuquerque, New Mexico, U.S.A.

<sup>4</sup>Lawrence Livermore National Laboratory, Livermore, California, U.S.A.

<sup>5</sup>FZ-Jülich Euratom Association, Jülich, Germany

<sup>6</sup>Australian National University, Canberra, Australia

<sup>7</sup>National Institute for Fusion Science, Gifu-ken, Japan

<sup>8</sup>University of California, Los Angeles, California, U.S.A.

<sup>9</sup>Columbia University, New York, New York, U.S.A.

A stochastic magnetic boundary, produced by an applied edge resonant magnetic perturbation, is used to suppress large edge localized modes (ELMs) in high confinement (H–mode) plasmas. The resulting H–mode displays rapid, small oscillations with a bursty character modulated by a coherent 130 Hz envelope. The H–mode transport barrier and core confinement are unaffected by the stochastic boundary, despite a three-fold drop in the toroidal rotation. These results demonstrate that stochastic boundaries are compatible with H–modes and may be attractive for ELM control in next-step fusion tokamaks.