

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

JET Snake Magnetohydrodynamic Equilibria¹ W. ANTHONY COOPER, J.P. GRAVES, O. SAUTER, A. POCHELON, Ecole Polytechnique Federale de Lausanne, EPFL/CRPP, Association Euratom-Suisse, Switzerland — A long-lived density perturbation labelled a “snake” has been observed in the JET tokamak with pellet injection for toroidal field $B_t = 3.1T$ and toroidal current $I_t = 3MA$.² Spontaneous snakes triggered by core impurity accumulation have also been reported at $B_t = 2.8T$ and $I_t = 4.2MA$.³ We compute model magnetohydrodynamic equilibria with the 3D ANIMEC code⁴ that can recover snake-like conditions by prescribing peaked pressure and hollow toroidal current profiles which are consistent with those in the experimental discharges.⁵ The internal helical distortions that look like snake structures have been obtained with the following parameters: $B_t \simeq 2.65T$, $I_t = 3.75MA$, $q_0 \simeq 1.7$, $q_{min} \simeq 1$, $q_{edge} \simeq 7.5$, $\ell_i \simeq 1.2$, $\langle\beta\rangle \simeq 2.4\%$, $\beta_N \simeq 2.3$.

¹This work was supported in part by the Swiss National Science Foundation. We are grateful to S.P. Hirshman for his invaluable contributions to this research.

²R. D. Gill *et al.*, Nucl. Fusion **32** (1992) 723.

³*ibid.*

⁴W. A. Cooper *et al.*, Comput. Phys. Commun. **180** (2009) 1524.

⁵M. Hugon *et al.*, Nucl. Fusion **32** (1992) 33.

W. Anthony Cooper
Ecole Polytechnique Federale de Lausanne,
EPFL/CRPP, Association Euratom-Suisse

Date submitted: 15 Jul 2010

Electronic form version 1.4