Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Edge stability analysis of JET Quiescent H-mode experiments. M.F.F. NAVE, Associacao EURATOM/IST, Lisbon, Portugal, G. HUYSMANS , CEA Cadarache, France, J-S. LONNROTH, Association EURATOM-Tekes, Finland, V. PARAIL, UKAEA, UK, M. MARASCHECK, W. SUTTROP, IPP-Garching, DE, EFDA-JET TEAM — The edge stability of JET QH-mode plasmas has been studied using the transport code JETTO coupled to a quasi-linear model for ballooning and peeling modes. Attempts on JET to access the Quiescent H-mode (QM-mode) regime with counter-NBI heating, produced plasmas with extended ELM-free phases up to 1.5 s duration. These were characterised by continuous edge n=1 MHD modes similar to the DIII-D "edge harmonic oscillation." Some of the edge parameters, such as high edge pedestal temperatures ($T_{i,e} \sim$ 2-3 keV) and high current densities are similar to the ELM-free hot-ion H-mode regime previously studied at JET. The latter was also characterised by an n=1 mode, the outer mode, observed in co- and counter- NBI when the edge was kink unstable, but still below the unstable ballooning threshold. Here we explore the possibility that the edge n=1 mode observed in the QH-mode plasmas may be a saturated peeling/ external kink mode. Continuous peeling modes can be obtained at high edge temperature, because slow current redistribution maintains the edge current unstable for long periods. Modelling assumptions have been verified using the MHD stability code MISHKA. Predictive simulations with current ramp-up and ramp-down will be presented.

Maria-Filomena Nave
Associacao EURATOM/IST, Centro de Fuso Nuclear, Lisbon, Portugal

Date submitted: 21 Jul 2005 Electronic form version 1.4