Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

First results with thin shell and active mode control in the RFX-mod experiment STEFANO MARTINI, Consorzio RFX, Associazione Euratom-ENEA sulla Fusione, RFX TEAM — Plasma experiments resumed in December 2004 on RFX-mod. The machine now has a thin (3mm) Cu shell with one overlapped poloidal gap and one toroidal gap. Penetration time for Bv has been lowered from 450 to 50 ms and shell/plasma proximity from b/a = 1.24 to 1.1. Toroidal equilibrium is feedback-controlled and new power supplies provide a more flexible control of the toroidal field. Newly designed graphite tiles protect the vessel from highly localized power deposition. The MHD Mode Control System, MHD-MCS, a set of 192 external saddle coils controlled by a digital feedback system, will act on field errors, radial fields due to dynamo modes and resistive wall modes (RWMs). First experiments at 300-600 kA without active mode control have been very encouraging, since performance similar to that of the thick shell machine has been readily achieved both in terms of pulse length and plasma confinement. The loop voltage is higher by 2-3 V, likely because of enhanced plasma-wall interaction due to the faster penetration of radial field components of locked MHD modes and to systematic field errors. Such radial fields, as well as errors due to RWMs, will be corrected by the MHD-MCS, which should further improve the performance, demonstrating the possibility to operate a large RFP without a thick conducting shell, and obtain access to enhanced RFP scenarios. Commissioning of the MHD-MCS is under way and first results will be presented at the Conference.

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Date submitted: 15 Jul 2005 Electronic form version 1.4