Abstract Submitted
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Overview of MAST results IAN CHAPMAN, CCFE, MAST TEAM — MAST addresses key issues for ITER and DEMO. ELM mitigation with RMPs with n=2,3,4,6 has been demonstrated: at high and low collisionality; for the first ELM; during the current ramp; when in-vessel coils fail; and with rotating n=3 RMPs. n=4,6 RMPs cause less braking whilst H-mode access is easiest with n=4. Refuelling allows reduced peak heat flux but only 10% drop in confinement. Gyrokinetic simulations of micro-tearing modes are consistent with ELM precursors strikingly observed with beam emission spectroscopy. Global gyrokinetic runs show kinetic ballooning modes mediate the pedestal width. A scan in beta at L-H transition shows that pedestal height scales strongly with core pressure. The observed tilt of low-k turbulent vortices increases with flow shear, due to a decrease in poloidal wave number. Highly efficient electron Bernstein wave current drive (1A/W) has been achieved in solenoid-free start-up. Langmuir probes and a high-speed camera suggest filaments play a role in particle transport in the private flux region whilst coherence imaging has measured scrape-off layer flows. MAST Upgrade is due to operate in 2015 to support ITER preparation and importantly to operate with a Super-X divertor to test extended leg concepts for particle and power exhaust.

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