Abstract Submitted
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Microinstabilities in the pedestal region[1] DAVID DICKINSON, BENJAMIN DUDSON, HOWARD WILSON, York Plasma Institute, Dept. Physics, University of York, YO105DD, UK, COLIN ROACH, CCFE, Culham Science Centre, OX143DB, UK — The regulation of transport at the pedestal top is important for the inter-ELM pedestal dynamics. Linear gyrokinetic analysis of the pedestal region during an ELM cycle on MAST has shown kinetic ballooning modes to be unstable at the knee of the pressure profile and in the steep pedestal region whilst microtearing modes (MTMs) dominate in the shallow gradient region inboard of the pedestal top. The transition between these instabilities at the pedestal knee has been observed in low and high collisionality MAST pedestals, and is likely to play an important role in the broadening of the pedestal. Nonlinear simulations are needed in this region to understand the microturbulence, the corresponding transport fluxes, and to gain further insight into the processes underlying the pedestal evolution. Such gyrokinetic simulations are numerically challenging and recent upgrades to the GS2 gyrokinetic code help improve their feasibility. We are also exploring reduced models that capture the relevant physics using the plasma simulation framework BOUT++. An electromagnetic gyrofluid model has recently been implemented with BOUT++ that has significantly reduced computational cost compared to the gyrokinetic simulations against which it will be benchmarked.

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