Abstract Submitted
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Investigation of the effect of flow shear and the ITG on gyrokinetic MAST turbulence[1] LOUIS VAN WYK, EDMUND HIGHCOCK, University of Oxford, ANTHONY FIELD, Culham Centre for Fusion Energy, ALEXANDER SCHEKOCHIHIN, University of Oxford, COLIN ROACH, Culham Centre for Fusion Energy — We study the effect of flow shear γ_E and ion temperature gradient a/L_{Ti} on L-mode turbulence in MAST using gyrokinetic simulations. These parameters play a crucial role in regulating and driving turbulence and together with the ratio of the safety factor to the inverse aspect ratio, q/ε, define a "zero-turbulence manifold" (ZTM) that represents the critical values needed to sustain turbulence. Nonlinear simulations show that by varying γ_E and a/L_{Ti} within experimental errors the turbulence crosses the ZTM, implying that the experiment operates close to marginality. In this parameter regime flow shear is very effective at regulating the turbulence, which is found to be subcritical. Finally the structure of the turbulence was studied: statistical parameters such as radial, perpendicular and parallel correlation lengths and the correlation time were calculated and found to be in reasonable agreement with experimental results obtained using Beam Emission Spectroscopy.

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