Abstract Submitted
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Experimental characterization of turbulent modes in the DIII-D H-mode pedestal[1] ANDREW NELSON, FLORIAN LAGGNER, AHMED DIALLO, Princeton Plasma Physics Laboratory, ZHENG YAN, University of Wisconsin Madison, EGEMEN KOLEMEN, Princeton University, DIII-D TEAM — In a novel experiment on DIII-D, the behavior of inter-ELM pedestal instabilities responsible for particle and heat transport is probed by imposing fast vertical oscillations (jogs) on the entire plasma. These jogs induce current near the plasma edge, which is shown to couple with and modify the behavior of instabilities resident near the edge transport barrier. In the analyzed discharges, high-frequency modes appear after profile gradient clamping and increase in frequency as the plasma rotation velocity recovers. High-resolution magnetic and density fluctuation measurements localize these modes near the pedestal foot. After a jogging event, these microinstabilities appear at a higher frequency before slowing to their typical pre-ELM state while modes at the pedestal top remain unchanged. Analysis of charge-exchange data shows a significant overshoot in the post-jog recovery of the radial electric field well in the pedestal region that is associated with increased plasma rotation and mode frequency, showing correlation between the mode and the peak diamagnetic frequency. These observations point towards the classification of these modes as micro-tearing modes, in agreement with previous gyrokinetic work on DIII-D.

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