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Studies of L-H Transition Thresholds in Electron Heated Regimes MIKHAIL MALKOV, PATRICK DIAMOND, PEI-CHUN HSU, University of California, San Diego — We discuss transitions in collisionless, electron heated regimes where the electron-ion coupling is *anomalous*, due to the fluctuation of $\langle \mathbf{E} \cdot \mathbf{J} \rangle$ work and explore new transition scenarios, characterized by the sensitivity of transition evolution to pre-existing L-mode profiles *where turbulence driven shear flows are absent*. We have developed a reduced model that evolves the collisionally coupled electron and ion temperatures, density, turbulence intensity, and flow profiles. The power threshold minimum in density is revealed *as a combined effect of the density dependence of collisionless electron − ion coupling and e − i heating mix*. To treat collisionless regimes, we have included anomalous power coupling between electrons and ions, using a recent theory of minimum enstrophy relation to model flow damping. Our preliminary results suggest that $L \rightarrow H$ transition occurs as the endstate of an *electron − ion thermal coupling front*. Upon arriving at the edge, it impulsively raises T_i there, thus strengthening the diamagnetic electric field shear. This study highlights the importance of collisionless energy transfer process to transitions of regimes of ITER relevance.

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