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Study of a correlation between shear Alfven activity and electron transport in NSTX D. STUTMAN, L. DELGADO, K. TRITZ, M. FINKENTHAL, Johns Hopkins University, N. GORELENKOV, E. FREDRICKSON, S. KAYE, E. MAZZUCATO, Princeton University — A rapid increase in central ($r/a \leq 0.4$) electron heat transport with increasing beam power is observed in NSTX beam heated H-modes. The large gap between electron heat and ion particle diffusivity suggests electron loss along stochastic field lines. The stability analysis indicates that central thermal gradients are too weak to drive any known micro-instability. Since the only constituent having substantial gradients inside $r/a \leq 0.4$ are the non-thermal beam ions, we advance that it is this component that drives electron transport, through the persistent shear Alfven Eigenmode (*AE) activity they induce. Using simple beam stepping experiments a potential correlation is found between central electron transport and global Alfven (GAE) activity. Plasmas having rapid transport show also intense, broadband GAE activity, while plasma with low transport are essentially GAE free. In addition, the non-linear increase in electron transport with beam power seems correlated with a threshold in the GAE mode superposition. The initial theoretical assessment of a possible GAE/electron transport connection suggests indeed that multiple modes may induce stochastic transport of trapped electrons.

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