Abstract Submitted
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Impurity Ion Heating by Cyclotron Absorption of Magnetic Turbulence in MST[1] P.W. TERRY, V. TANGRI, G. FIKSEL, University of Wisconsin-Madison — Treating magnetic turbulence in the MST reversed field pinch device as an Alfvénic cascade from globally unstable tearing modes, impurity ion heating from cyclotron damping of the turbulence is calculated. Numerical solution of the plasma dispersion relation yields a branch that is shear Alfvén-like for low parallel wavenumber. At intermediate wavenumber the real part of the frequency tends toward the cyclotron frequency, while for higher wavenumber the frequency becomes zero at a critical value. Damping is strongest near the critical frequency[2]. For parameter values of the experiment, the damping yields impurity heating rates consistent with the rise of impurity temperature during transient events of enhanced magnetic turbulence. Temperature evolution is modeled from a 0-D transport calculation, which also shows that collisional transfer from impurities to the bulk species can account for experimental values of the bulk species. The theory also describes the evolution of parallel and perpendicular temperatures. [2]V. Tangri, et al., Phys. Plasmas **15**, 112501 (2008).

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