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Limits of stochastic thermal transport in PPCD discharges in MST Y.M. YANG, B.E. CHAPMAN, D.J. DEN HARTOG, A.F. FALKOWSKI, W.S. HARRIS, N.C. HURST, C.P. KASTEN, E. PARKE, J.A. REUSCH, J.S. SARFF, H.D. STEPHENS, University of Wisconsin-Madison — High current improved confinement plasmas in MST exhibit a large increase in the central electron temperature to $\sim$ 2 keV, and the temperature gradient region broadens. Interestingly the maximum temperature gradient tends to occur in a region near the toroidal field reversal surface (r/a $\sim$ 0.8) where the density of resonant surfaces for tearing modes is highest. Recent upgrades to the Thomson scattering diagnostic on MST have greatly improved the capability for single-shot profile measurements with high time resolution. Improved confinement discharges obtained using Pulsed Poloidal Current Drive (PPCD), a form of transient inductive current profile control, can therefore be analyzed to better understand the mechanisms which lead to the best confinement performance. This permits an investigation of the role of residual stochasticity of the magnetic field in energy transport, taking advantage of the shot-to-shot variability in the level of tearing mode suppression that happens naturally with PPCD. Measurements of the evolution of the Te(r,t) profile and local power balance are compared with the evolution of the tearing mode spectrum to investigate this physics. Supported by USDoE.

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