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Observation of Hot Remnant Islands using Fast Thomson Scattering L.A. MORTON, W.C. YOUNG, D.J. DEN HARTOG, C.C. HEGNA, University of Wisconsin - Madison, E. PARKE, University of California - Los Angeles, J.A. REUSCH, C.M. JACOBSON, University of Wisconsin - Madison — The MST Fast Thomson Scattering Laser, operating with repetition rates of up to 100 kHz for up to 25 laser pulses, has allowed direct observation of temperature structures produced by tearing modes rotating at 10 - 20 kHz. A hot spot observed by Fast TS coincides with the O-point of the dominant m/n = 1/6 mode reconstructed by MHD modeling from edge magnetic measurements. The electron thermal conductivity inside the island is estimated from power balance to be 75 m^2/s. However, MHD modeling also predicts overlap between the n=6 and n=7 islands, producing chaotic field lines and total loss of the island flux surfaces. Ensemble-averaged data from the slower burst laser (25 kHz for 8 pulses) also indicates overlap between the temperature fluctuations associated with these modes. These temperature fluctuation also exhibits the large higher-harmonic content that characterizes the hot island in the single-shot cases. DEBS finite-beta MHD simulations qualitatively reproduce MST temperature structures in certain cases. This work is supported by the US DoE and the NSF.

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