

Abstract Submitted
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Perturbative Thermal Transport Studies on Alcator C-Mod and ASDEX Upgrade¹ A.J. CREELY, A.E. WHITE, MIT Plasma Science and Fusion Center, E.M. EDLUND, Princeton Plasma Physics Laboratory, N.T. HOWARD, ORISE, A.E. HUBBARD, MIT Plasma Science and Fusion Center, F. RYTER, Max-Planck-Institut fuer Plasmaphysik — Perturbative thermal diffusivity has been measured on Alcator C-Mod and ASDEX Upgrade via the extended-time-to-peak method with heat pulses generated by partial sawtooth crashes. Heat pulses generated by sawtooth crashes have been used extensively in the past to study perturbative diffusivity [Lopes Cardozo, N.J., PPCF 37, 799 (1995)], but the details of the sawtooth event lead to non-diffusive “ballistic” transport, invalidating their use for measuring perturbative diffusivity [Fredrickson, E.D. et al., PoP 7, 5051 (2000)]. Partial sawteeth generate a heat pulse without the ballistic transport of full sawteeth [Fredrickson 2000]. Partial sawtooth analysis was applied to over 50 C-Mod shots containing both L- and I-Mode, as well as ASDEX Upgrade plasmas, though partial sawteeth were less common on AUG. Results indicate correlations between perturbative diffusivity and confinement regime (L- vs. I-mode), as well as correlations with local temperature, density, the associated gradients, and gradient scale lengths (a/L_T and a/L_n). Finally, diffusivities calculated from partial sawteeth were compared to perturbative diffusivities calculated with the GYRO gyrokinetic code, leading to quantitative agreement with multi-scale GYRO simulations.

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