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Perturbative electron heat transport experiments in a quasi-helically symmetric stellarator G.M. WEIR, K.M. LIKIN, University of Wisconsin, B.J. FABER, PPPL, J.N. TALMADGE, F.S.B. ANDERSON, D.T. ANDERSON, University of Wisconsin — Results from perturbative heat transport experiments on the Helically Symmetric eXperiment (HSX) will be presented and compared to linear gyrokinetic predictions from the GENE code made in collaboration with the PPPL. A gyrotron capable of modulating 200 kW at frequencies up to 6 kHZ was installed to perform these experiments. The electron temperature response to 6% ECRH modulation is monitored with a 16 channel ECE system. The measured stiffness in the electron heat flux, $1 \leq \chi_e^{HP}/\chi_e^{PB} \leq 4$, is higher than the gyrokinetic prediction for the quasi-helically symmetric configuration of HSX. The measured stiffness decreases and comes into better agreement with gyrokinetic results with increasing ECRH power per particle. This reduction of stiffness is accompanied by decreased broadband density fluctuations measured through reflectometry. These results will be compared to perturbative heat transport experiments in which the quasi-helical symmetry is intentionally degraded to test the effect of neoclassical transport on stiffness in the electron heat flux.

Gavin Weir
University of Wisconsin

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