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Increased Parallel Viscous Damping Near Magnetic Islands in HSX JOHN SCHMITT, JOSEPH TALMADGE, DAVID ANDERSON, HSX Plasma Laboratory, University of Wisconsin-Madison, STEFAN GERHARDT, Princeton Plasmsa Physics Laboratory — The quasisymmetric field in HSX can be broken due to the interaction of the main n=4, m=1 helical magnetic field with the mode structure imposed by naturally forming magnetic islands at rational surfaces. This interaction gives rise to additional components of the magnetic field spectrum that increase the parallel viscous damping in the vicinity of the islands. We calculate the neoclassical increase in the two plasma flow damping rates on a magnetic surface as well as the local increase in the radial conductivity. Using a biased electrode to spin the plasma, a Mach probe to measure the time evolution of the plasma flow and Langmuir probes to measure the electric field, we present initial measurements to demonstrate the effects magnetic islands have on the quasihelically symmetric field in HSX.

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