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Gyrokinetic Simulations of Off-Axis Minimum-q Profile Corrugations[1] R.E. WALTZ, K.H. BURRELL, J. CANDY, General Atomics, M.E. AUSTIN, University of Texas, Austin — Quasi-equilibrium radial *profile corrugations* in the electron temperature gradient (ETG) are found at lowest order singular surfaces in global gyrokinetic (GYRO) code simulations of monotonic and off-axis minimum-q DIII-D discharges. The profile corrugation in the gradients are time average components of the zonal flows. As the off axis minimum-q=2 surfaces enters the plasma the corrugations are measurably large and appear to trigger an internal transport barrier (ITB). The corrugation in the electron temperature gradient have the bump-dip-bump structure seen in the DIII-D experiments. *These profile corrugations constitute the first direct experimental observation of zonal flows in a tokamak plasma* and confirm the physical reality of corrugations in a way not previously possible. Contrary to previous claims there is no dip in transport flow associated with the minimum-q "gap" in singular surface density. There is a strong dip in ion energy flow from the strong ExB shear corrugation and consistent with an ITB.

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