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Theory and Simulation of Quasilinear Transport from External Magnetic Field Perturbations in a DIII-D Plasma,* R.E. Waltz and N.M. Ferraro, *General Atomics* —The linear response profiles for the 3D perturbed magnetic fields, currents, ion velocities, plasma density, pressures, electric potential due to external resonant magnetic field perturbations (RMP) are obtained from the collisional two-fluid M3DC[1] code. A newly developed RMPtran code computes the resulting quasilinear ExB and magnetic radial transport flows in all channels: ion and electron particle and energy, as well as toroidal angular momentum (TAM). The relative mix of ambipolar ExB and non-ambipolar magnetic particle transport and resulting JxB torque is of particular interest. Surprisingly much of the core RMP island JxB torque braking plasma rotation is returned to accelerate the plasma edge. Our main focus is on delineating the mechanisms for the RMP density pump-out where the radial convection of TAM is competitive with the magnetic braking of plasma rotation. Enhancement of the two-fluid crossfield resistivity, heat diffusivity, and viscosity represents the effects of turbulence on the low-n RMP transport. High-n turbulent transport is to be taken from the TGLF transport model.

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