MHD Effects on Resonant Magnetic Perturbations

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Resistive MHD simulations with M3D indicate the plasma is cooled by parallel transport in the stochastic magnetic field produced by the applied resonant magnetic perturbation (RMP). The density is advected by convective cells resembling blobs, while at the same time density perturbations extend to the plasma core. Toroidal and / or poloidal rotation screen the RMP from the plasma, except for a thin stochastic layer near the separatrix. The temperature is modified only slightly, while the density perturbations persist. The effect of the RMP depends on details of the MHD equilibrium. In NSTX, RMPs have been found ineffective. An effort is underway to understand this. Some examples of RMPs with different MHD equilibria will be presented.

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