

Biassed electrode experiments in H-1NF

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A variety of plasmas over a range of magnetic fields in the H1 heliac have been biased using an internal molybdenum electrode to drive radial electric current. The current drawn (~Amps) rarely seems to be limited by cross-field resistivity. Instead, the sheath either at the bias electrode or at the limiting surfaces in the scrape-off layer usually provides the dominant circuit impedance. Although the plasma potential is strongly perturbed, large potential gradients are not produced by the biasing. This result indicates strong damping of flow in the heliac. Neither neoclassical parallel viscosity nor collisional cross-field momentum transport appears sufficient to explain the damping.

The effect on the plasma is quite marked: electron current drawn to the probe reduces the electron density, and ion current increases it. Electron density time history and profiles, and spectroscopic investigations of rotation and possible impurity injection will be presented. Possible implications about the scrape-off layer will be discussed.