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Power Balance in a Helicon Plasma. DAN BERISFORD, Univ of Texas at Austin, LAXMINARAYAN RAJA, ROGER BENGTSON, CHARLES LEE — We present results of a series of experiments exploring the mechanisms of power flow in a helicon plasma. The power absorbed by the plasma ultimately flows out in the form of heat through various channels. An infra-red camera records images of the quartz dielectric confinement tube outer surface, from which we calculate the total power lost to the glass as a function of position. Inside the vacuum chamber, Langmuir probes measure plasma density and temperature profiles, and bolometers measure the radial energy flux near the plasma edge. RF current and voltage sensors measure the forward power delivered to the plasma. Using these diagnostics, we can account for most of the input power, and we see that a large portion of the power is lost radially to the walls of the dielectric confinement tube.

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