Attenuation of ICRH-induced potentials in the SOL of Tore Supra

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RF sheath rectification, which arises in front of powered ICRH antennas, causes a local increase of time-averaged plasma potential and hence enhances sputtering. When a reciprocating Langmuir probe is magnetically connected to a powered ICRH antenna, perturbations of the SOL plasma parameters are observed mainly in the vicinity of the antenna with a typical radial extension up to 2cm. Although perturbations are observed along the entire leading edge of the antenna's poloidal protection limiters, they are most intense on field lines passing near the top and bottom of the antenna straps. Large increase of floating potential V_{fl} and shear of the parallel flow are observed, while the local density shows little modification. Recent experiments show that a key parameter affecting the amplitude of plasma parameter perturbations is the plasma density. For a given machine configuration and constant ICRH power the amplitude of V_{fl} decreases by factor of 2 for a 20% increase in density. At the same time, the voltage applied to the antenna strap V_{strap} changes by ~ 20% and the skin depth of the evanescent slow wave remains roughly constant implying that variations of V_{strap} cannot cause such strong modulations of V_{fl}. In addition, the parallel flow shear diminishes as density increases. These results indicate that control of edge density might provide a means to attenuate RF sheath effects in ICRH-heated tokamaks.