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Controlling plasma with plasma waves

NATHANIEL FISCH, Princeton University

The interior regions of even very hot plasma can be reached by electromagnetic waves injected at the plasma periphery using antennas or waveguides. These waves can couple to waves supported by the plasma medium. Various means of controlling the plasma behavior become possible as these plasma waves dissipate heat or momentum, or otherwise couple to plasma electrons or ions. Because of the resonant properties of the wave-particle interaction, the control can be very selective. This talk reviews the basic mechanisms of the wave-particle interaction in plasma, the uses of plasma waves in tokamak plasmas, including the generation of electric current to enable steady state operation or to limit heat transport, as well as uses of wave-particle interactions in other plasma devices.