Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

**Plasma Response to Waves in Arbitrary Magnetic Field Geometry** BRENT GOODE, JOHN R. CARY, University of Colorado, L.A. BERRY, Oak Ridge National Lab — We examine the effect that complicated magnetic geometries and collisions have on the propagation and absorption of radio frequency waves in a plasma. This is accomplished by calculating a conductivity tensor for the plasma using the method of integration along characteristics. The geometric effects included are magnetic field curvature, perpendicular gradients, quadratic parallel gradients, and the full effect of linear parallel gradients. Previous theories treated only the lowest order effects of linear parallel gradients and treated collision in an arbitrary manner. The effect of higher order parallel gradients and collisions is to reduce or eliminate instances where the imaginary part of the Z function is negative. Other new term have no significant effect. One dimensional calculations of wave propagation and absorption in a tokamak are performed using the AORSA1D code. The result of these calculations demonstrate a clear change in power absorption due to the proper treatment of collisions and higher order effects of linear parallel gradients.

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Date submitted: 26 Jul 2005 Electronic form version 1.4