

ABSTRACT

Title of Dissertation: THREE WAVE INTERACTIONS IN A
 WEAKLY COLLISIONAL PLASMA

Andrew Case, Doctor of Philosophy, 2001

Dissertation directed by: Professor Richard Ellis
 Department of Physics, UMCP
 Professor Frederick N. Skiff, Co-Advisor
 Department of Physics and Astronomy, University of Iowa

This dissertation presents an overview and analysis of three wave interaction data collected in a weakly collisional Argon II plasma. Two parent waves are launched in the plasma and the plasma response is measured at the sum frequency. The primary diagnostic is Laser Induced Fluorescence, providing sufficient resolution in velocity and space to allow analysis of the mode structure of the second order perturbed distribution function f_2 . The analysis shows that the f_2 signal measured at the sum frequency is due to waves being launched by the interaction of the parent waves, and that these waves consist of at least two distinguishable modes.