

Abstract Submitted  
for the DPP06 Meeting of  
The American Physical Society

**Observations of an Ion Driven Instability in the CNT QUINN MARKSTEINER, THOMAS PEDERSEN, JASON KREMER, REMI LEFRANCOIS, JOHN BERKERY, Columbia University** — An instability develops when there is an appreciable ion fraction in an otherwise pure electron plasma in the CNT stellarator. Plasma oscillations with real frequencies around 12kHz are observed for a wide range of experimental parameters, with a local peak in growth rate when  $w_{pe}^2/w_{ce}^2 \approx 2.5 * 10^{-4}$ . Much stronger oscillations in the 1kHz range are also observed intermittently. Ion driven instabilities have been observed in penning traps and pure toroidal electron traps, and the theory describing them is fairly well known. However, the existence of magnetic surfaces in CNT makes the physics governing an ion driven instability in this machine very different from penning and pure-toroidal traps. This poster presents experimental and basic theoretical work that is being done to understand how this ion driven instability evolves on magnetic surfaces.

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Date submitted: 20 Jul 2006

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