Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

Magnetic Field Effects on the Turbulent Critical Energy using BCS Theory[1] J.A. JOHNSON, III, E.D. MEZONLIN, C.T. RAYNOR, Center for Plasma Science and Technology, Florida A&M University — When the BCS theory is applied using the G-L equations to turbulence, and the value of the critical turbulent energy $U_{c,}$is derived directly from the force constraint (and intermolecular constants), the role of the electron can be replaced by the constituent atoms (or ions) and an explicit role for an external magnetic field can be determined. The existence of a lambda-like behavior in turbulent transport coefficients confirming that there may be a second order (continuous) phase transition as systems evolve from a non-turbulent to a turbulent state specifically allows for the isolation of the critical turbulent energy and speculation on the possibilities of direct manipulation of transport behaviors in a variety of plasma turbulent systems.

[1]This research is supported in part by a Grant from the DOE Office of Fusion Energy Science to FAMU.

J. A. Johnson, III
Center for Plasma Science and Technology, Florida A&M University

Date submitted: 06 Aug 2006 Electronic form version 1.4