

Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Structure and stability of relativistic two-fluid electron-positron jets JESSE PINO, HUI LI, Los Alamos National Laboratory, SWADESH MAHAJAN, Institute for Fusion Studies, University of Texas at Austin — Magnetized, rotating compact objects can launch jets with large Lorentz factors. Using a temperature-transformed magnetofluid coupling formalism, we derive the relativistic two-fluid equations in vortex form. For the case of homentropic pair plasmas, we find analytic self-organized solutions in cylindrical geometry. Various temperature, density and Lorentz factor profiles are considered. We compare these solutions to previous jet models, focusing on magnetic tower type jets with an external return current. Finally, we investigate the stability of the equilibria to MHD and two-fluid perturbations.

Jesse Pino
Los Alamos National Laboratory

Date submitted: 17 Jul 2009

Electronic form version 1.4