Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Off-axis stability of intense continuous relativistic beams[1] RENATO PAKTER, LUCIANO C. MARTINS, FELIPE B. RIZZATO, Instituto de Fisica - Universidade Federal do Rio Grande do Sul, Brazil — This paper investigates the stability of off-axis continuous intense relativistic beams propagating inside a circular conducting pipe. The equations of motion for the centroid and the envelope of slightly off-axis beams are derived and used to determine equilibrium and stability conditions for the beam transport. It is shown that depending on the parameters of the system, beams propagating along the pipe axis may become unstable due to the presence of the wall, imposing a fundamental limitation in the effective area that an equilibrium beam can occupy inside the conductor. Self-consistent N-particle simulations are used to verify the findings.

[1]Work supported by CNPq, Brazil and the US-AFOSR under Grant No. FA9550-09-1-0283.

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Date submitted: 16 Jul 2009 Electronic form version 1.4