Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Compression of Plasmas: shocks and stuff GIOVANNI LAPENTA, JOSHUA KING, GIAN LUCA DELZANNO, LANL — A common occurrence in plasmas is local compression. We revisit the issue by asking the question: how is compressing a plasma different from compressing a gas? Compressing an ideal gas is hardly a new topic in physics. Indeed our modern industrial civilization was spurred by the first experiments on gas and steam compression. Still the issue is worth revisiting in the light of how different it is when magnetization effects are included. When a gas is compressed, the classic Riemann problem needs to be solved. The same is true in plasma physics, but is rarely done. Often one neglects the effects of shocks. We investigate the issue on 3 levels. First, we consider a gas dynamics model based on Eulers equations. Second, we consider the same approach including the effect of B (MHD shocks). Finally, we consider the kinetic answer for a collisionless system, focusing primarily on the role of the pressure tensor anisotropy.

Giovanni Lapenta
LANL

Date submitted: 19 Jul 2005 Electronic form version 1.4