MHD simulation of plasma compression experiments MERITT
REYNOLDS, SANDRA BARSKY, PETER DE VIETIEN, General Fusion — General Fusion (GF) is working to build a magnetized target fusion (MTF) power plant
based on compression of magnetically-confined plasma by liquid metal. GF is testing
this compression concept by collapsing solid aluminum liners onto plasmas formed
by coaxial helicity injection in a series of experiments called PCS (Plasma Compression, Small). We simulate the PCS experiments using the finite-volume MHD code
VAC. The single-fluid plasma model includes temperature-dependent resistivity and
anisotropic heat transport. The time-dependent curvilinear mesh for MHD simulation is derived from LS-DYNA simulations of actual field tests of liner implosion. We
will discuss how 3D simulations reproduced instability observed in the PCS13 experiment and correctly predicted stabilization of PCS14 by ramping the shaft current
during compression. We will also present a comparison of simulated Mirnov and x-ray diagnostics with experimental measurements indicating that PCS14 compressed
well to a linear compression ratio of 2.5:1.

Meritt Reynolds
General Fusion