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Finite Element Modeling for Megagauss Magnetic Field Generation[1] DAVID MARTINEZ, RADU PRESURA, University of Nevada, Reno — Applying external magnetic fields with MegaGauss strength is needed for hot plasma confinement and stabilization. We investigate the possibility of generating ultra-high magnetic fields with the fast z-pinch generator "Zebra" for experiments at the NTF. Zebra can produce a load a current of 1 MA in 100 ns. To design appropriate loads we use Femlab[2] and Screamer[3] to simulate the magnetic field. Screamer predicts the load current using a detailed model of Zebra and helps optimize the operation. Using the information from Screamer, Femlab is able to calculate the magnetic field, heating, and stress on the conductor. All these effects must be taken into consideration to determine the integrity of the coil until maximum field is reached. The presentation will include simulation results for single- and multi-turn coils, as well as quasi-force-free inductors.

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