**INTRODUCTION**

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).

**MHD SIMULATION WITH VAC**

Shock capturing Eulerian Finite Volume code by Gábor Tóth.

In-house modifications:
- Improvements for strong toroidal fields (e.g., slope-limiting \( r_B \) instead of \( B_B \))
- Coupling MHD to external circuit models
- Independent ion and electron temperatures
- Classical parallel heat transport

Transport:
- Spitzer temperature dependent resistivity
- Various models for radial heat transport, \( \chi \)
- Constant viscosity for simplicity

**Stabilization by Ramping Shaft Current**

\[
\frac{\partial \mathbf{B}}{\partial t} = -\nabla \times (\mathbf{v} \times \mathbf{B}) - \nabla \times \left( \frac{1}{2} \nabla \times \mathbf{B} \right) + \frac{1}{\mu_0} \mathbf{n} \times \mathbf{J}
\]

\[
\frac{\partial \mathbf{J}}{\partial t} = -\nabla \times \mathbf{E} - \frac{1}{\rho} \mathbf{J} \times \mathbf{B} + \frac{1}{\rho} \left( \nabla \times \mathbf{B} \times \mathbf{B} \right)
\]

Compression ratio:
\[
\frac{\rho}{\rho_0} \approx 1.6
\]

**SUMMARY**

- MHD simulations showed stabilizing effect
- Motivated inclusion in PCS14 experiment
- Compression was stable at least to \( R_0/R = 2.5 \times \)

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