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Effects on Stable MHD Region of a Magnetized Target Plasma Compression AARON FROESE, General Fusion Inc., DYLAN BRENNAN, Princeton Plasma Physics Laboratory, SANDRA BARSKY, MERITT REYNOLDS, General Fusion Inc., ZHIRUI WANG, Princeton Plasma Physics Laboratory, MICHEL LABERGE, General Fusion Inc. — General Fusion is designing a magnetized target fusion reactor to compress a toroidal plasma inside a liquid metal cavity and heat it to fusion conditions. Plasma compression in realistic geometry is modelled as a series of equilibrium states generated by CORSICA. The resistive and ideal MHD stability of each equilibrium is analyzed using the resistive DCON code. We find plasma conditions that are stable to high compression and show how their range is affected by geometry and current density effects. The results are confirmed for representative cases with a time-dependent MHD simulation. Stability is found to be strongly affected by the current density near the plasma edge. Due to the solid central shaft and its effect on plasma elongation, compression reduces the current density near the edge to conserve the q profile. However, this effect is offset by magnetic field diffusion into the liquid metal. At high compression ratios, self-similar compression geometries are ideal MHD unstable for intermediate n, but a central shaft and wall resistivity are both found to be stabilizing.

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