

Gas Embedded Compressional Z-Pinch in H2 and D2

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Abstract

Recent experiments in a gas embedded compressional Z-pinch are presented. The experiments have been carried out in H₂ and D₂, using a pulse power generator capable of delivering a $di/dt > 10^{12}$ A/s. The pinch is initiated by a focused laser pulse, which is coaxial with a cylindrical DC microdischarge. This configuration results in double column pinch at early times, which at current rise evolves into a gas embedded compressional Z-pinch. Diagnostics used are Rogowski coil, single frame holographic interferometry and holographic shadowgraphy, visible streak camera images from which, current, density, line density, pinch radius and plasma motion are obtained. The pinch is characterised by a maximum on axis density which is much higher than the expected value from filling pressure, with a Bennett temperature of 75 eV at 180 kA.