

Abstract Submitted
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Plasma Gun Design for Magnetohydrodynamic Turbulence Studies CARLOS CARTAGENA, DAVID SCHAFFNER, Bryn Mawr College — A long pulsed plasma gun is under development for magnetohydrodynamic (MHD) turbulence studies at the Bryn Mawr College Plasma Laboratory. An avalanche breakdown of hydrogen gas occurs between two coaxial copper electrodes when biased at about 5kV creating a nearly fully ionized plasma. The plasma is injected into an externally generated magnetic field shaped to have radial field lines between the inner and outer electrodes. The field is maintained at the stuffing threshold—approximately where plasma injection due to currents balances plasma stagnation due to the field. This allows a steady plasma and magnetic helicity injection without depleting charge carriers in the gun region. Plasma is launched into a 24 cm diameter flux-conserving multi-diagnostic chamber, where magnetic field fluctuations and ion saturation current can be measured in order to examine their turbulent properties.

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