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MHD Evolution in Point-Source Helicity Injection Driven Plasmas on Pegasus[1] J.L. BARR, M.W. BONGARD, M.G. BURKE, R.J. FONCK, E.T. HINSON, A.J. REDD, University of Wisconsin-Madison — Point-source helicity injection for non-solenoidal startup on PEGASUS produces plasmas with $I_p \leq 0.17$ MA consistent with Taylor relaxation. The helicity injection supplies an effective loop voltage V_{eff} inversely proportional to the plasma toroidal flux Ψ_T. Accurate measurement of the V_{eff} evolution requires equilibrium reconstructions. Helicity injection-driven plasmas originate on the outboard, low-field side and expand inward to fill the vessel. This evolution increases Ψ_T, reducing V_{eff} from ≥ 10 V to ≤ 2 V. Supplemental loop voltage from poloidal field induction is used to obtain higher plasma current. I_p growth is accompanied by bursts of $n = 1$ magnetic activity with frequencies between 10–150 kHz, abrupt inward motion of the plasma, and a drop in internal inductance. This magnetic activity persists during helicity injection. Afterward, MHD quiescence is obtained and persists in discharges subsequently sustained by ohmic induction. The spectral content of these magnetic fluctuations measured with a scanning Mirnov probe does not differ significantly with distance from the plasma edge.

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