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Pinch Mitigation in the UCLA tokamak[1] P.-A. GOURDAIN, J.-L. GAUVREAU, D.J. LAFONTEESE, W.A. PEEBLES, L.W. SCHMITZ, R.J. TAYLOR, UCLA Physics and Astronomy Department — The UCLA tokamak (R = 5 m, B = 0.25 T, A = 5, a = 1 m, I_p = 60 kA) produces long-pulse (< 5s), clean plasmas that exceed the Greenwald density limit and approach the β limit. Ohmic discharges exhibit a significant negative radial electric field and associated poloidal rotation, which are thought primarily responsible for an observed particle pinch. Calculations indicate that this "electric pinch" is an order of magnitude stronger than the omnipresent Ware pinch. This particle accumulation produces a rather peaked density profile. Due to strong MHD activity, the density build-up slows and a large disruption follows, returning the core density back to initial values without terminating the discharge. A series of experiments aimed at explaining and controlling the pinch are presented. Direct mitigation of the pinch has been demonstrated using low power ICRF, a positively biased electrode or a perturbative magnetic field at the edge of the plasma.

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