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Pinch Mitigation in the UCLA tokamak[1] P.-A. GOURDAIN, J.-L. GAUVREAU, 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 m, a = 1 m, κ = 1.5, I_p = 50 kA, τ_{pulse} < 5 s) is running excellent and clean plasmas since 2000. Ohmic discharges show poloidal rotation, without any use of auxiliary heating. This natural spin generates a strongly peaked density profile. This particle pinch is due to a negative radial electric field, which increases considerably inward ion mobility. The density build-up usually terminates on strong MHD activity. A disruption brings the core density back down to lower values as the poloidal rotation suddenly reverses. A series of experiments aiming at controlling the pinch are presented. A direct mitigation of the pinch can be done using low power ICRF. Another method involves stochastic fields. By applying a local radial magnetic field, increased diffusivity also mitigates directly the pinch. Scaling these results to ITER, we explore the possibility of using this technique to exhaust ashes from the plasma.

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