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Plasma dynamics and quasi equilibrium in simply toroidal plasma in open field line configuration PRINCE ALEX, RUGGERO BARNI, CLAUDIA RICCARDI, University of Milan, Bicocca — In simply magnetized toroidal (SMT) device plasma is confined purely by toroidal field having close field line configuration. The crossfield transport arising from the E x B drift severely affects the plasma confinement and causes the entire plasma to be lost to the outer wall and prevents the plasma to be in MHD equilibrium. In this study a finite vertical field of 0.3 mT is superimposed to the toroidal field of 0.04 T, resulting in opening of the field lines characterized by a pitch ratio of $r_B = B_Z/B \tilde{} 7.5$ x 10^{-3} and $L_C = 2a(B_T/B_Z) \tilde{} 2333$ cm in filamentary hydrogen plasma. This short circuiting the current and limiting the electric field buildup and hence brings system to a quasi-stationary equilibrium. The time averaged profiles were analyzed and spatiotemporal evolution of structures has been studied by conditional sampling techniques and other statistical tools. Typical plasma parameters are $n_e \tilde{} 10^{16}\,m^{-3}$, T_e =1-10 eV, T_i =1 eV, $\nu = {}_{ExB}$=3 x 10^3 m/s and $\Gamma_{ExB} = 10^{19} m^{-2} s^{-1}$.

Prince Alex
University of Milan, Bicocca

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