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Confinement regimes in simple magnetized toroidal plasmas[1] IVO FURNO, AMBROGIO FASOLI, BENOIT LABIT, PAOLO RICCI, CHRISTIAN THEILER, Centre de Recherches en Physique des Plasmas-Ecole Polytechnique Federale de Lausanne, Association EURATOM-Confederation Suisse, CH-1015 Lausanne, BARRETT ROGERS, Dartmouth College, Hanover, New Hampshire, 03755, USA — In the simple magnetized torus TORPEX (R = 1 m, a = 0.2 m), we explore experimentally the accessibility of a high confinement mode, which is predicted by theory for this configuration [P. Ricci, et al., Phys. Rev. Lett. 1**00**, 225002 (2008)]. We consider different gases (H_2, D, He, Ne, N_2) and we measure the dependence of the temperature and density gradients upon the ratio γ/v'_{ExB} (γ is the interchange linear growth rate and v'_{ExB} is the velocity shear). We observe that γ/v'_{ExB} decreases from γ/v'_{ExB} ∼6-7 for hydrogen to γ/v'_{ExB} ∼0.3-0.4 for neon. Consistently with theory, temperature and density profiles steepen when γ/v'_{ExB} drops below unity. The perpendicular particle flux is estimated by particle balance and measured using a multi-pin flux probe. First simulation results are presented with a global fluid code that solves the drift-reduced Braginskii equations in the whole TORPEX domain.

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