## Effects of plasma collisionality on tokamak edge turbulence\*

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The edge turbulence code BOUT is applied to the three tokamaks: C-Mod, DIII-D, and NSTX. Edge plasmas in these three experiments have rather different dimensional and non-dimensional parameters, such as plasma collisionality  $v^*$ , relative ion gyroradius  $\rho^*$ , and plasma  $\beta$ . Accordingly, the simulations show a substantial difference for these three cases. For the DIII-D case the level of plasma density fluctuations at the separatrix near the outer mid-plane is  $\delta n/n \sim 10\%$  and radially ejected blobs of plasma density are not observed; for NSTX case  $\delta n/n \sim 25\%$  and radially ejected blobs of plasma density are occasionally observed; and for C-Mod  $\delta n/n \sim 100\%$  and radially ejected blobs of plasma density are simulations - largest in C-Mod, next in NSTX, smallest in DIII-D - follows a trend that goes as the edge plasma collisionality. Varying  $Z_{eff}$  (keeping the ion density fixed) confirms the trend: larger  $Z_{eff}$  leads to stronger fluctuations covering larger part of radial domain. Apparently the different edge plasma collisionality is the primary cause of the differences in the turbulence.

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