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Intermittent Convective Transport in DIII-D Edge Plasmas[1] J.A. BOEDO, D.L. RUDAKOV, R.A. MOYER, D.G. WHYTE, University of California, San Diego, M.A. MAHDAVI, W.P. WEST, GA, J.G. WATKINS, SNL — Plasma density, temperature, potential and the inferred $E \times B_t$ radial transport measured with probes in the scrape off layer of H- and L-mode plasmas in the DIII-D tokamak display intermittent bursts corresponding to structures featuring higher pressure than the surrounding plasma and responsible for 50% of the $E \times B_t$ radial transport. The bursts appear at a rate of $\sim 10^4\,\mathrm{s}^{-1}$ and conditional averaging reveals they are positively charged and polarized by poloidal fields of up to 4000 V/m which propel the structures radially with $E \times B_t/B^2$ velocities of $\sim$2600 m/s near the last closed flux surface (LCFS) and $\sim$330 m/s near the wall. The bursts move poloidally at speeds of up to 4500 m/s at the LCFS, slowing down towards the wall as they shrink in radial size from 4 cm to 0.5 cm. The bursts have vorticity which is lost as they leave the LCFS. The measured cross-field turbulent transport and intermittent bursts affect the plasma refueling and impurity generation from the wall thus their understanding is fundamental to understanding of the interaction of a plasma core with its walls.

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