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Modelling Axial Flow Generation and Profile Evolution in CSDX Linear Device RIMA HAJJAR, PATRICK H DIAMOND, GEORGE R TYNAN, RONGJIE HONG, SAIKAT THAKUR, Univ of California - San Diego — We report on developments in reduced modelling of profile evolution in CSDX. The model includes effects of turbulence driven axial flows important for enhanced confinement in ITER. Recent studies revealed existence of such flows in CSDX, historically associated with non-vanishing parallel residual stress in the momentum flux. Studies also showed transition to enhanced confinement and amplification of mean axial flow shear as B increases. The model addresses the relation between perpendicular transport and axial flow dynamics and tracks time-space evolution of four fields: density n, axial and azimuthal flow profiles v_z and v_y and energy $\varepsilon = \langle \tilde{n}^2 + \tilde{v}_z^2 + (\nabla_\perp \tilde{\phi})^2 \rangle / 2$. With total energy conserved, parallel compressibility couples parallel and perpendicular directions allowing for the system to access the ∇n free energy, thus amplifying the parallel flow shear and depleting turbulent fluctuations. In this model, the particle flux is purely diffusive, while residual components are added to the Reynolds stresses. The model addresses: i) ∇n steepening with B, ii) the relation between v_y' and v_z', iii) the surge in parallel Reynolds work indicating coupling of fluctuating energy and parallel flow

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