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A Simple Dynamical Model of Flux-Driven Turbulence and Profile Evolution Z.H. WANG, P.H. DIAMOND, UCSD, CA, C.S. CHANG, S. KU, CIMS, NY University, X.G. WANG, PKU, CHN — We study nonlocal, flux driven turbulence and profile evolution using a simple model of coupled nonlinear reaction-diffusion equation, heat transport equation and density source-diffusion equation. We study temperature profile evolution in the presence of turbulence produced by a strong edge source, which spreads inward and interacts with both heat pulses and locally driven core turbulence. Basic results are: 1)propagation of intensity and heat pulse differs in that the speed of the former grows and then decays as heat flux Q increases, while the latter grows and saturates at a value set by neoclassical transport. 2) speed of inward propagating turbulence is sensitive to Q. It first increase as $\sqrt{Q}$ and then decreases as $1/Q$, following the formation of ITB. It suggests ITB location is determined by <u>both</u> heat flux and near edge conditions and ITB works as much by keeping turbulence <u>out</u> as by keeping heat <u>in</u>! 3) collisions of in to out and out to in pulses trigger local profile steeping, and (in some cases) ITB formation. Moreover, the interaction point varies with Q.

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