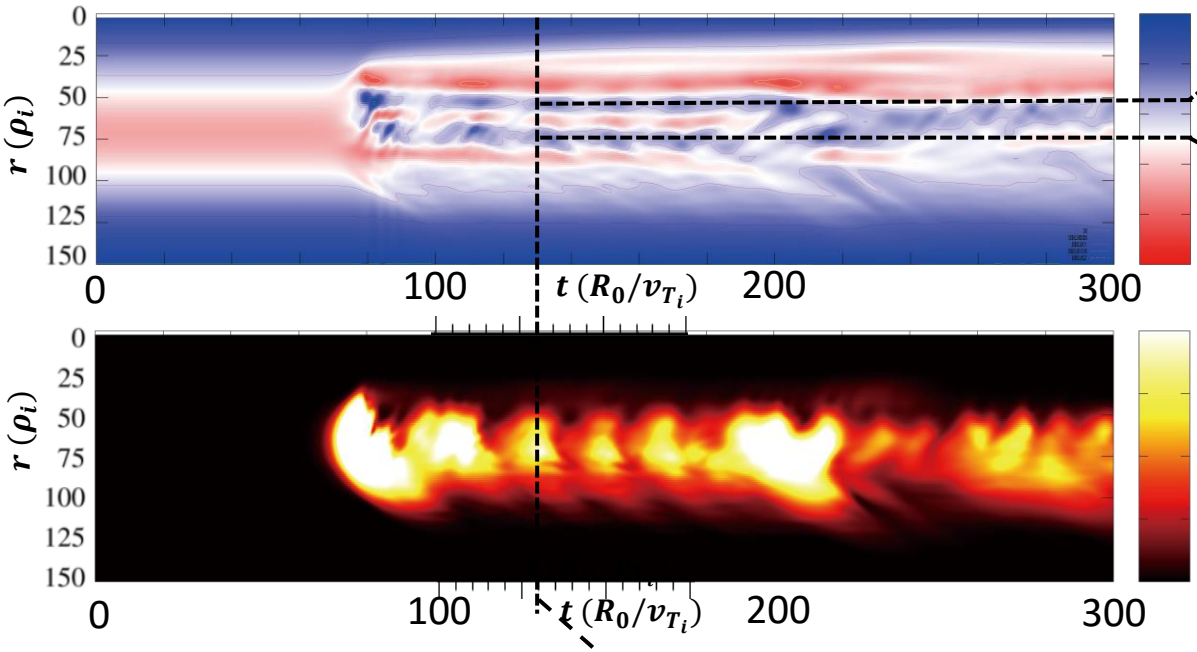
Formation and sustainment mechanism of $E \times B$ staircase.

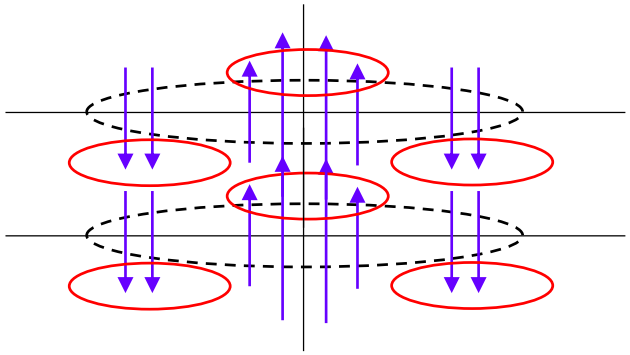
W. Wang (Kyoto Univ.)

delta-*f* simulation with constant external mean field

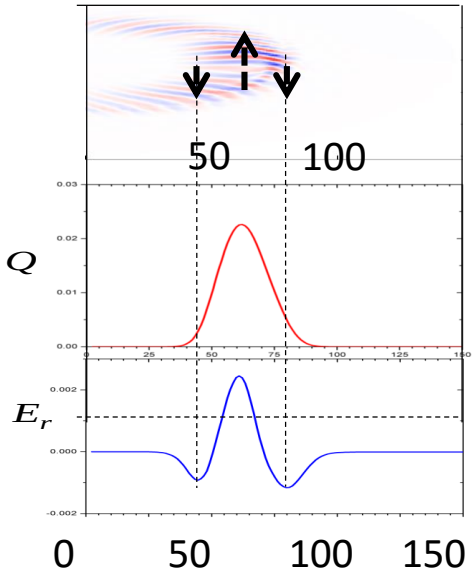


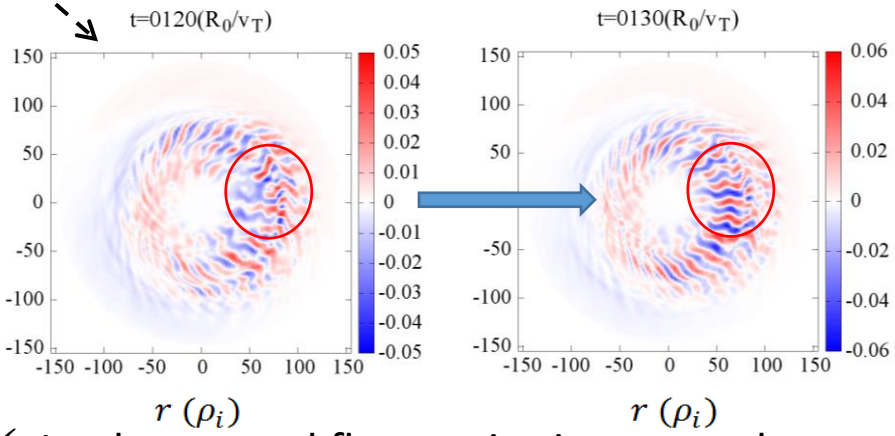
- Even Zonal flow excitation respect to the toroidal ITG mode.

$$\frac{\partial}{\partial t}\Delta_r \phi_{ZF} = -[\phi_d, \Delta_\perp \phi_d]$$



Phase alinement





radial length:

$\sim 25\rho_i$

time scale:

$\sim 20R_0/v_{T_i}$

- ✓ In phase zonal flow excitation through meso-scale turbulence . Similar mechanism may happens in flux-driven system.
- ✓ When burst happens, staircase also destroyed and rebuilt up.