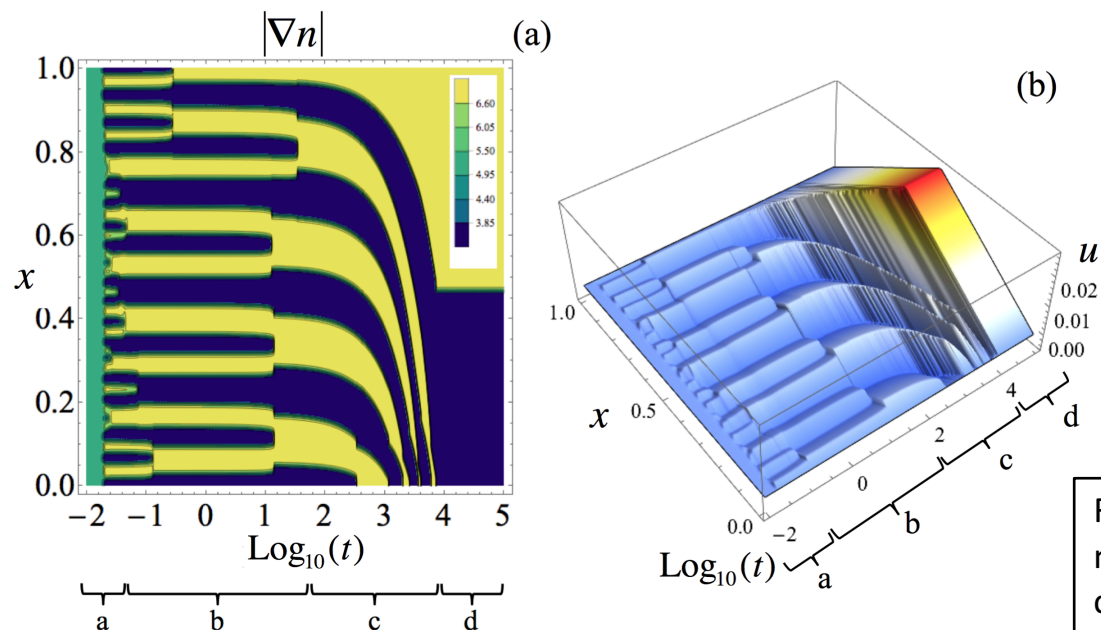


Negative Viscosity Models- Zonal Scale Selection, Staircases and Dynamical Symmetry Breaking

P.H. Diamond¹, A. Ashourvan¹, J. Li¹, M.A. Malkov¹, et al.

¹ CMTFO and CASS, UCSD, USA



- Theory of zonal flow scale selection and staircase formation
- Model reveals migration and condensation of staircase steps to form macro barrier layers
- Novel mechanism for nonlocality, via 'escalator mode'

Fig: Stages of evolution: a) Micro-steps merge into meso-steps. b) Meso-steps to barriers. c) Barriers condense at boundaries. d) Stationary profile.

- New dynamical symmetry breaking mechanism amplifies toroidal shear flows in electron drift wave turbulence, significant in weak shear plasmas
- Shear amplification enhances residual stress effect on flow profile gradient