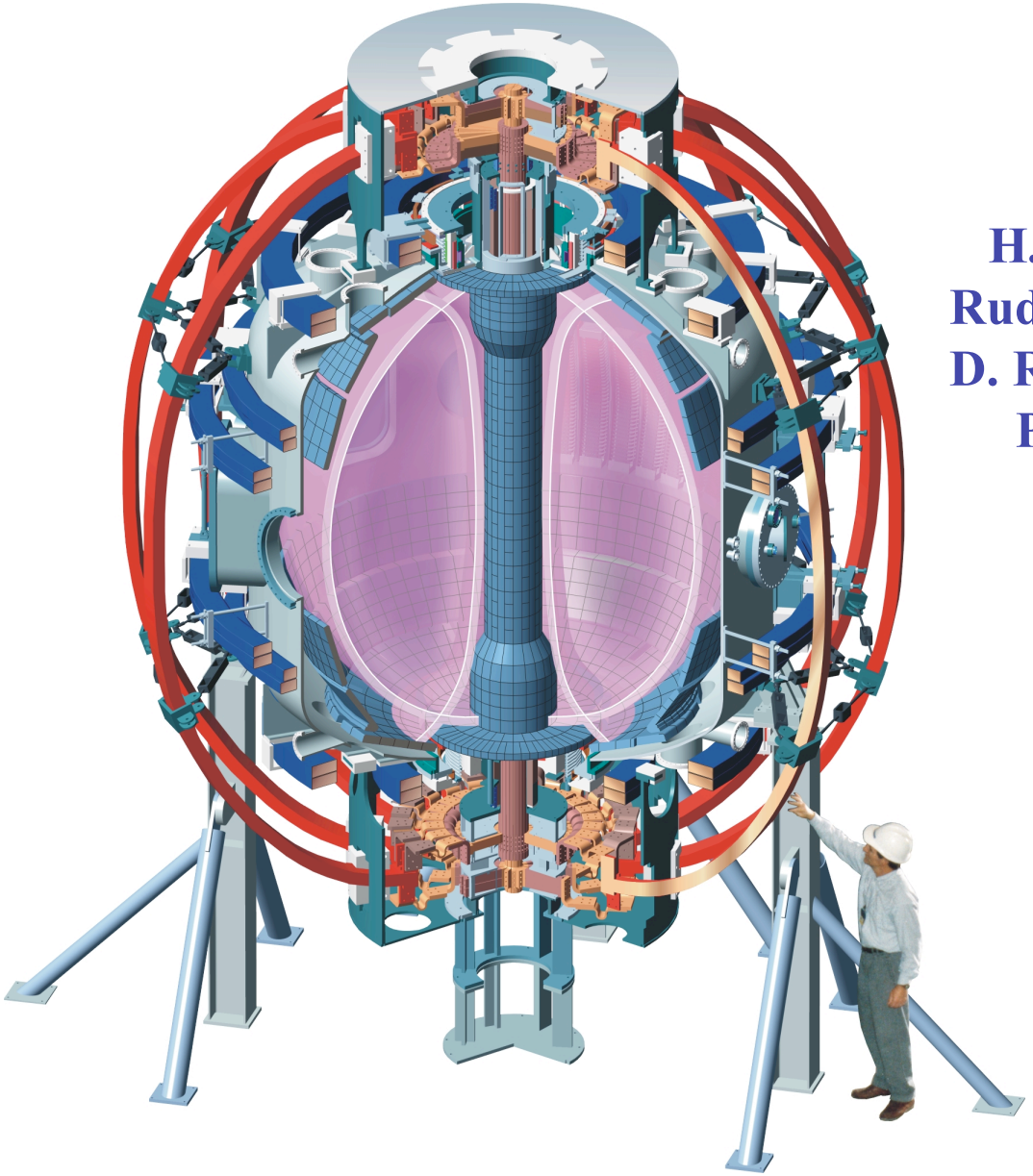
Fundamental Boundary Physics Issues



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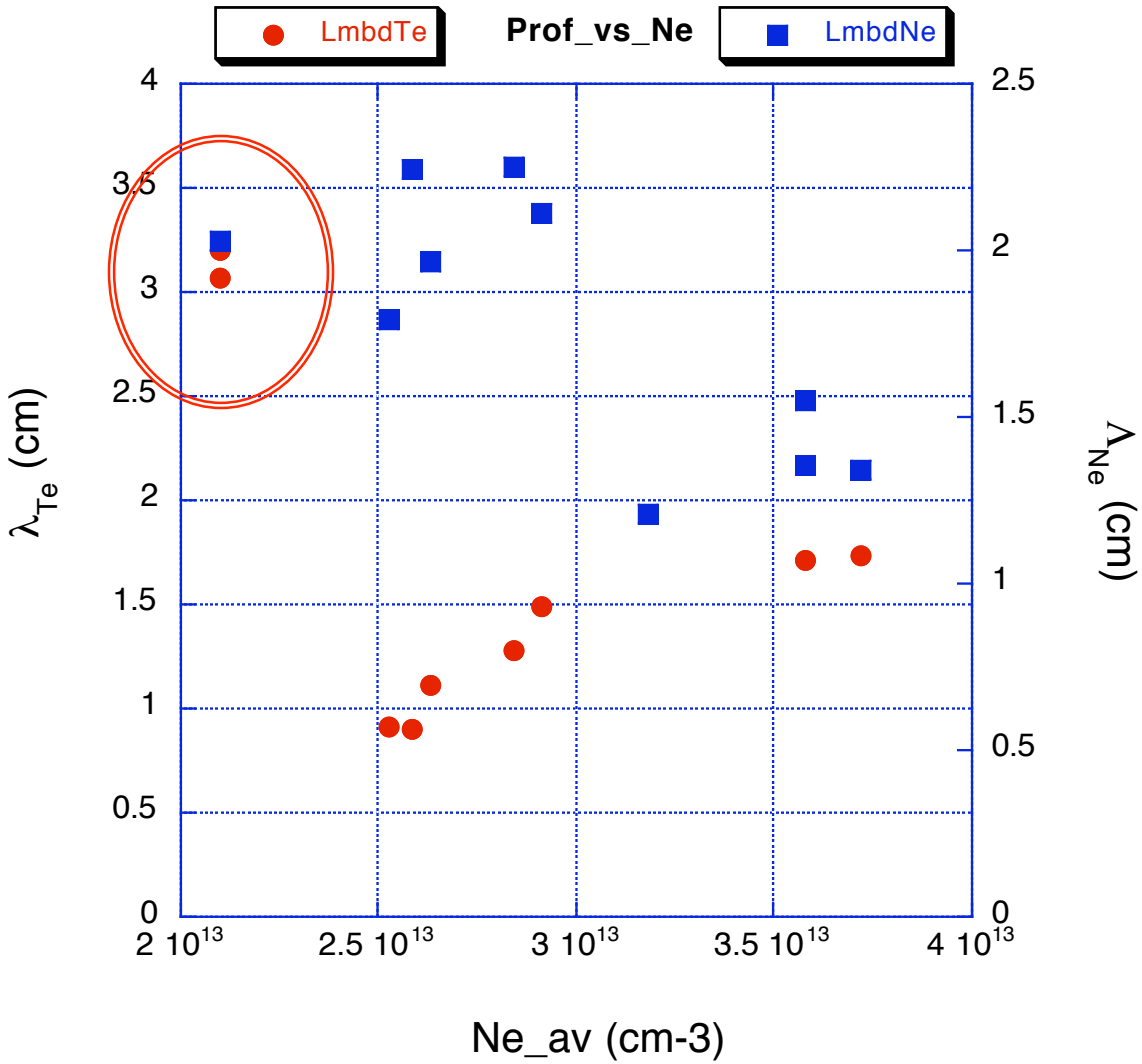
H. Kugel, S. Zweben, R. Maingi, D. Rudakov, H. Ji, T. Carter, N. Crocker, D. Rudakov, M. Umansky, D. Gray, A. Pigarov, D. D'Ippolitto, J. Myra, NSTX Team

Profile Scaling studies

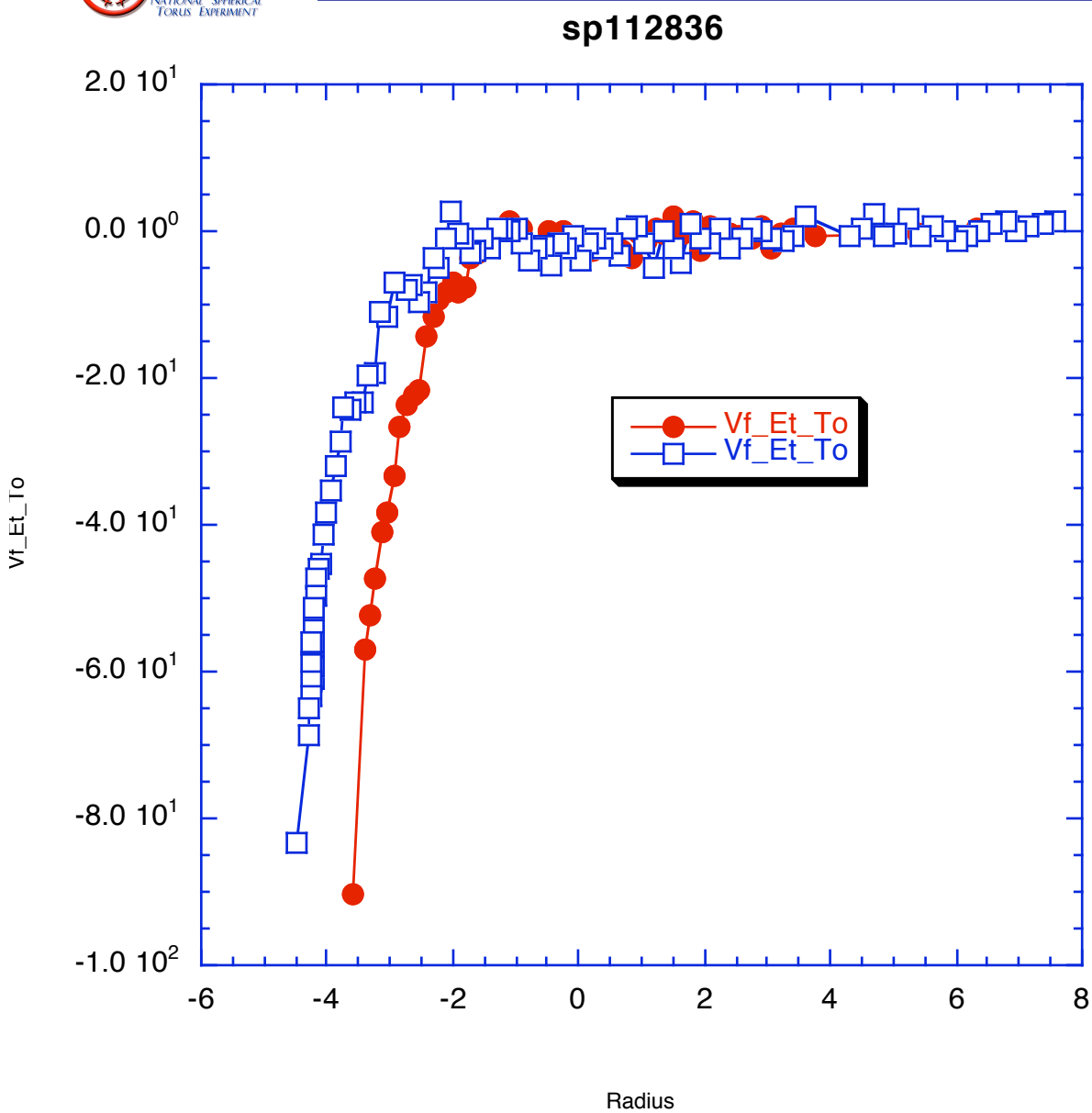


Study L-Mode low density regime and populate statistics

Extend to H-mode

Power scan

Study Er Formation (Radial Conductivity)



Use RF and NBI (Voltage scan) to change ion losses and Er

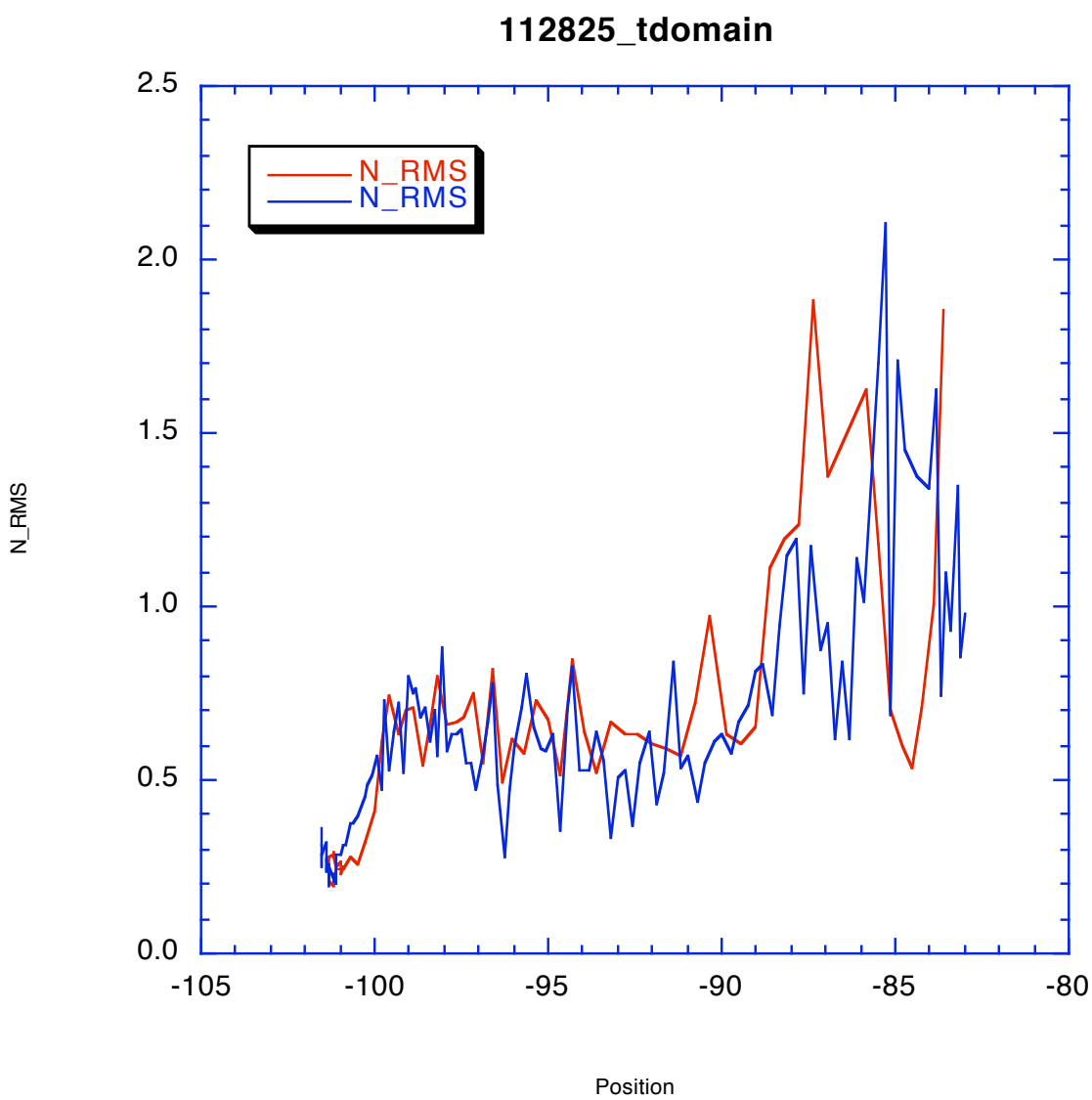
Use gas puffing to change ion-neutral friction (friction-viscosity)

$$F_f = (1 + 2q^2)\, m_i\, n_i\, \nu_{i0}\, V_\theta$$

$$\nu_{i0} = \langle \sigma_{CX} v_i \rangle n_n(r)$$

Measure Er with the probe and Spectroscopy

Continue Turbulent Transport Work



Systematic study of radial electrostatic transport (need H-mode scan and power scan)

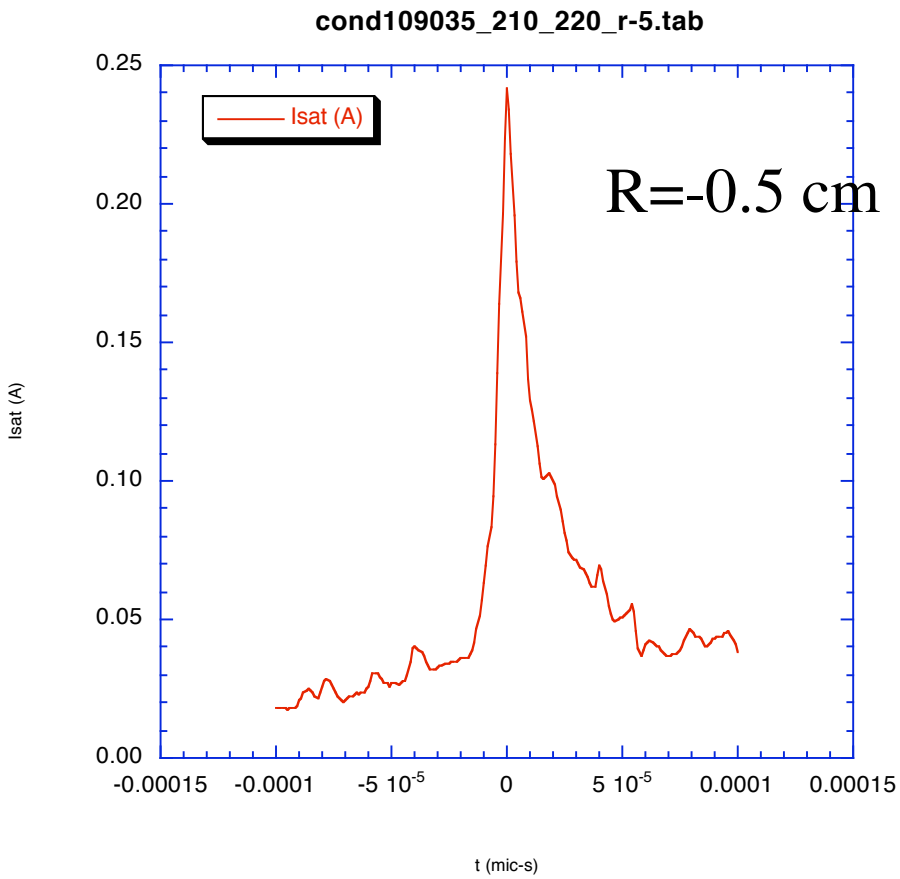
Initiate electromagnetic transport studies with new head

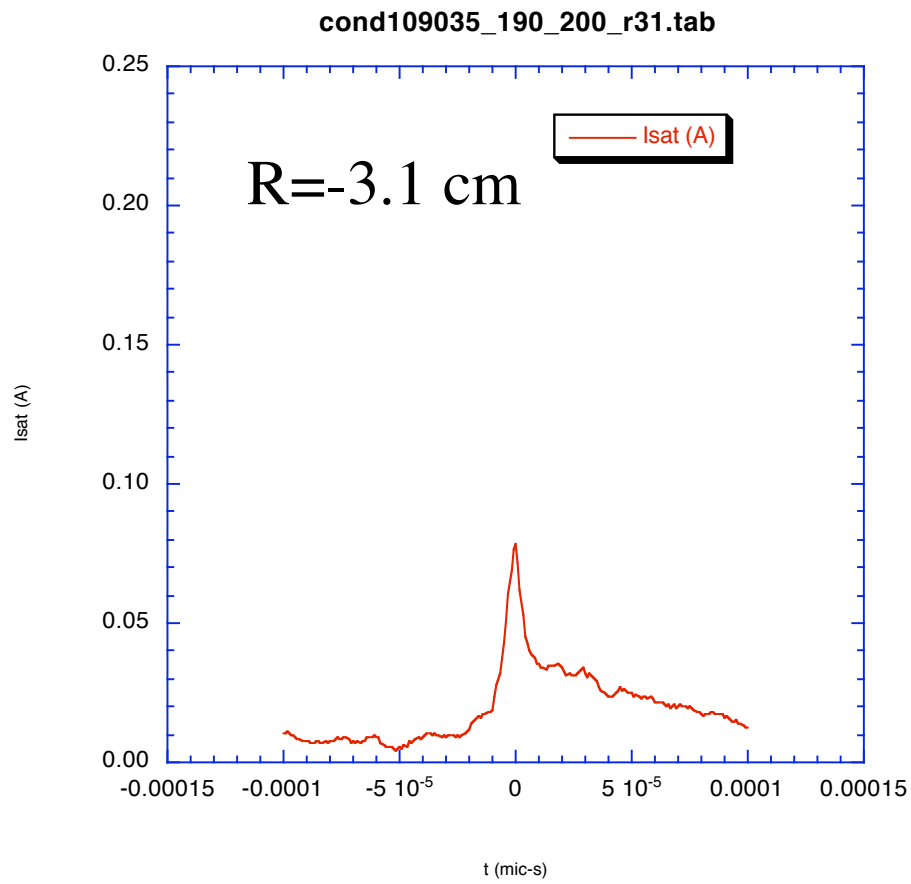
Intermittency Studies

Complete work in L mode

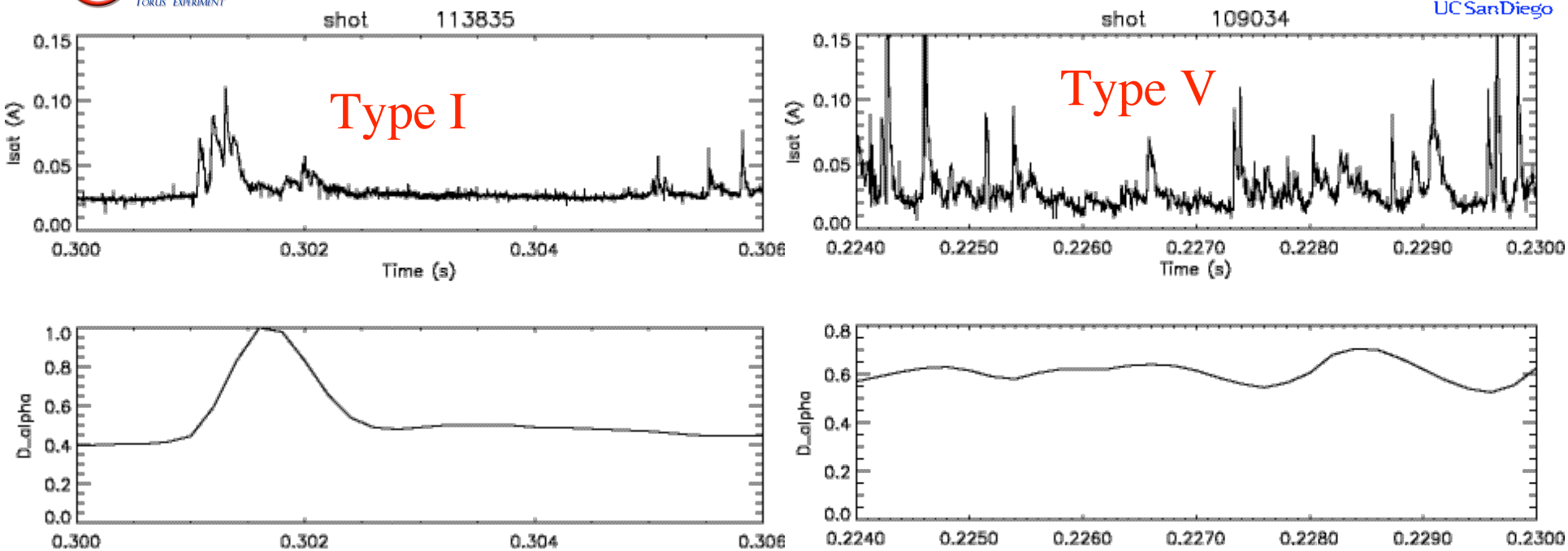
H-mode studies (density scan)

Add fast Te (energy flux)





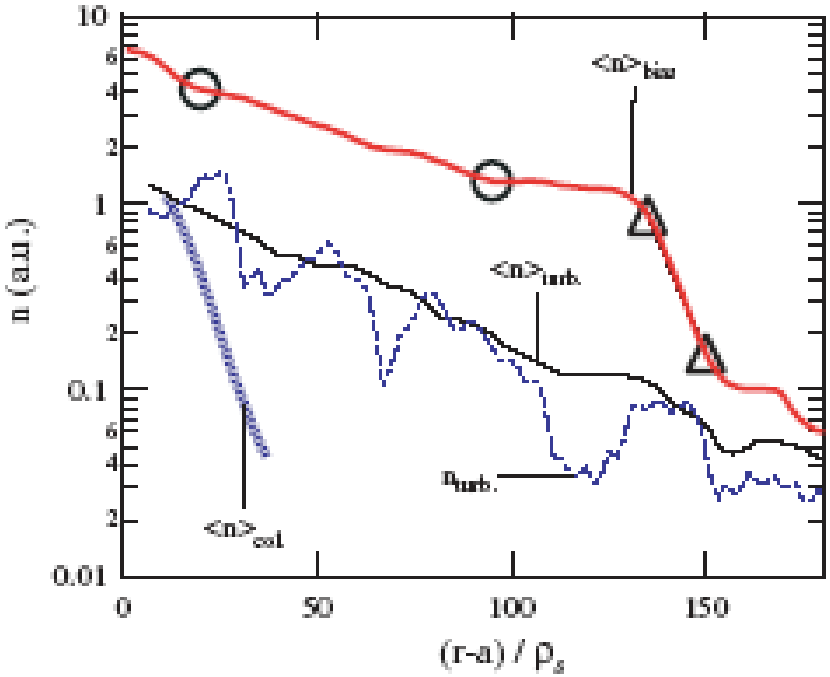
ELM dynamics studies



Started basic work with high time resolution

Need fast Te diagnostic (next year) to do a complete job

Effect of Biasing on Turbulence and Intermittency



Control radial transport/intermittency by using a biased limiter/divertor

Size and velocity of intermittent events are reduced and SOL width thus minimized