



# Investigation of Electron Thermal Transport

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# Compare Experimental Data to Theoretical Models



- The goal of this activity is to study electron transport in NSTX auxiliary heated plasmas by comparing to theoretical models.
- H- and L-mode plasmas produced with NBI and HHFW
- Build database of well documented and controlled plasmas.
  - Compare with standard ETG-based theoretical model (*e.g.* Horton et al, Phys Plasmas 7, 1494, 2000) and others.
  - Similar work done on Tore Supra
  - Pay attention to trapped particles issues (TEM)
- Data mining on the existing data set and piggy back ,but we need to review some specific experimental conditions...

# Plasma Conditions Needing Experimental Validation



- Long pulse steady state moderate density discharges with  $\beta_N \sim 5$ , MHD quiescent H mode. (108730/109070)
  - Further understanding of power balance needed
- ITB like plasma with  $T_e = 4$  keV, obtained with HHFV (105830)
  - Needs a good kinetic set from recent upgrades
    - MPPTS with 20 spatial points
    - CHERS with 51 spatial points (blips)
    - Multi spatial points XRCS

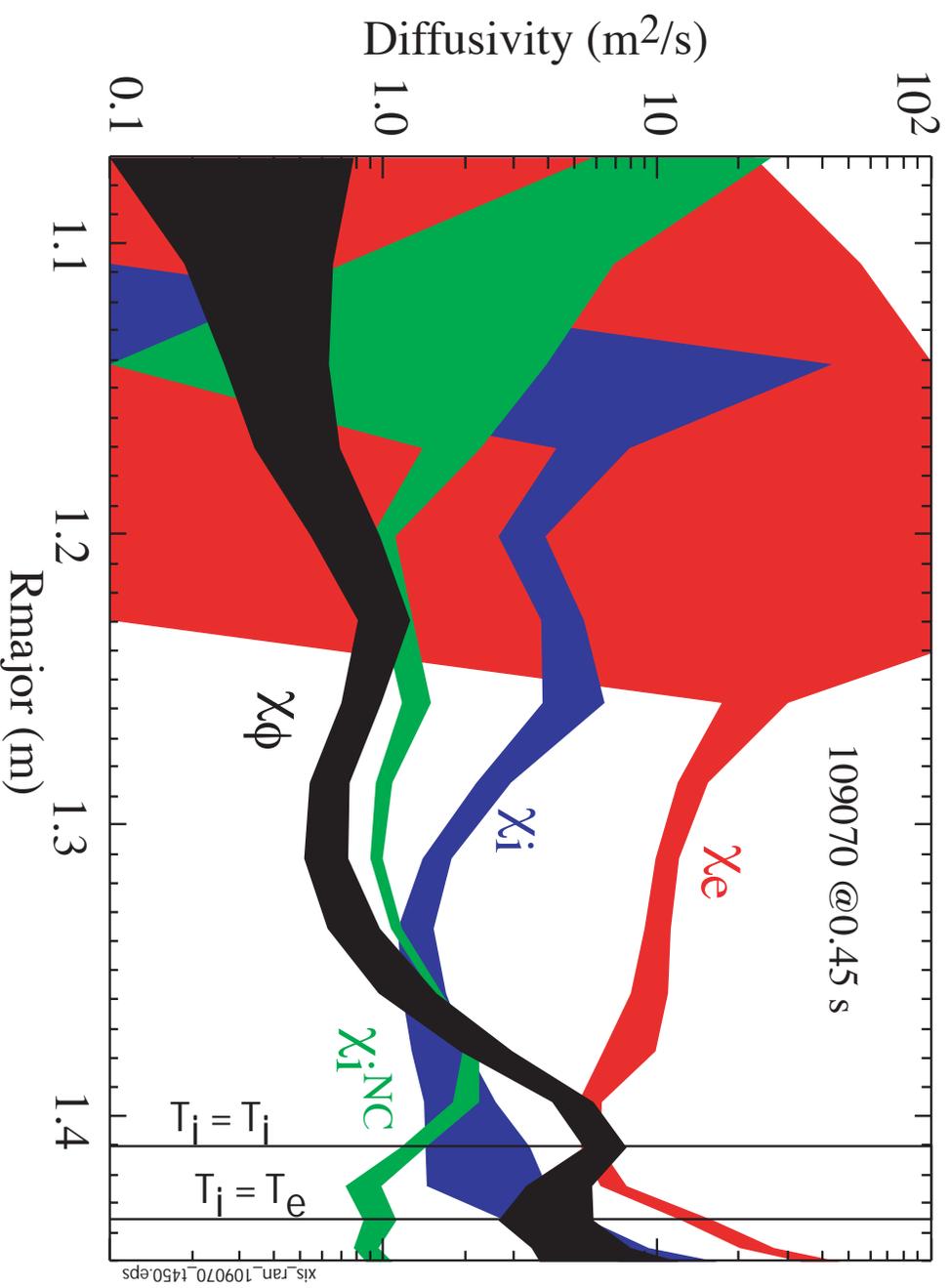


# END OF TALK

# Diffusivity Profiles vs Rmajor with Error Bars



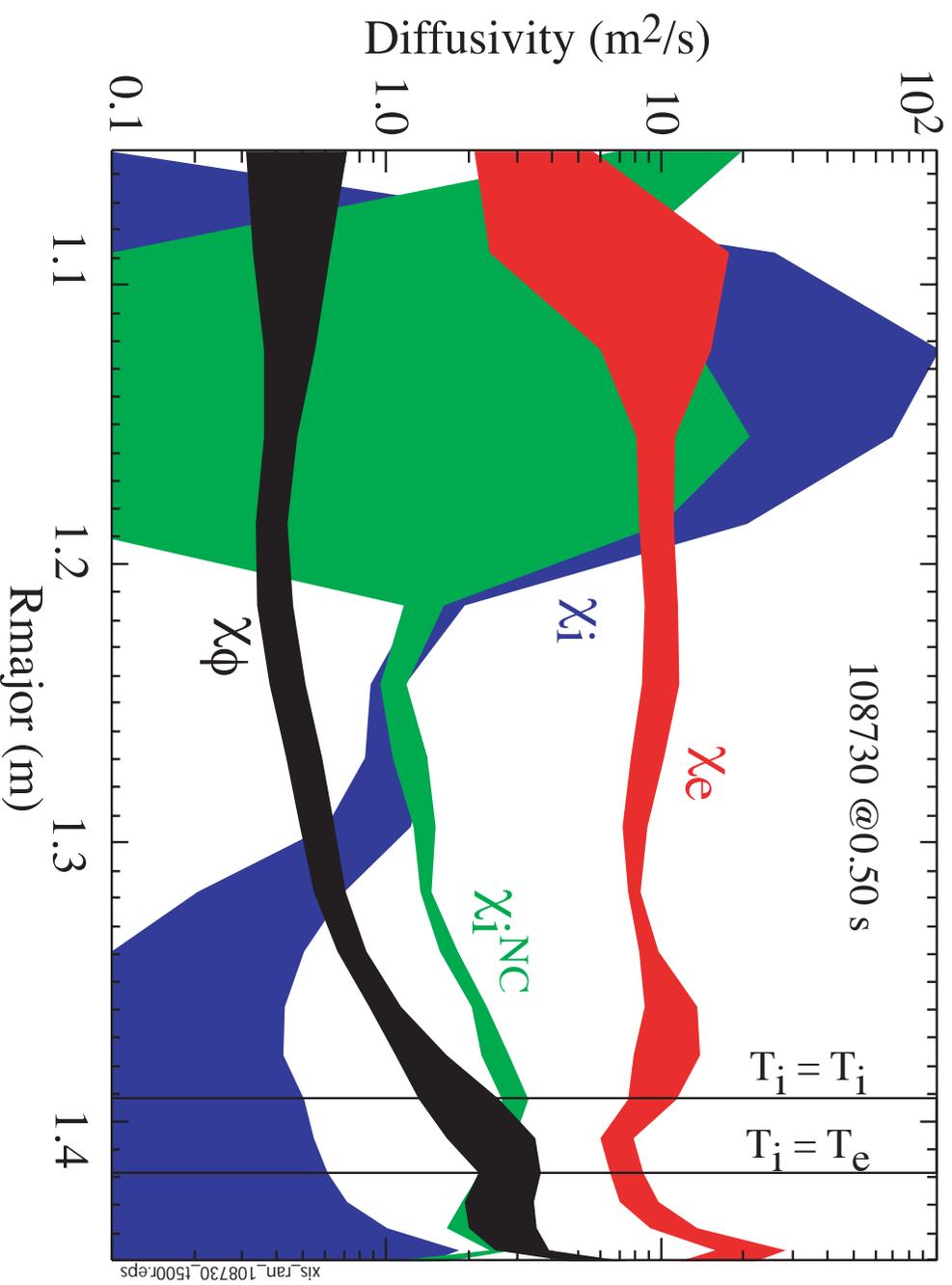
Steady state phase of a high power NBI plasma



# Diffusivity Profiles vs Rmajor with Error Bars



Steady state phase of a medium power NBI plasma



# Electron ITB Formation with HHHFW in Lower Density Deuterium Plasma

