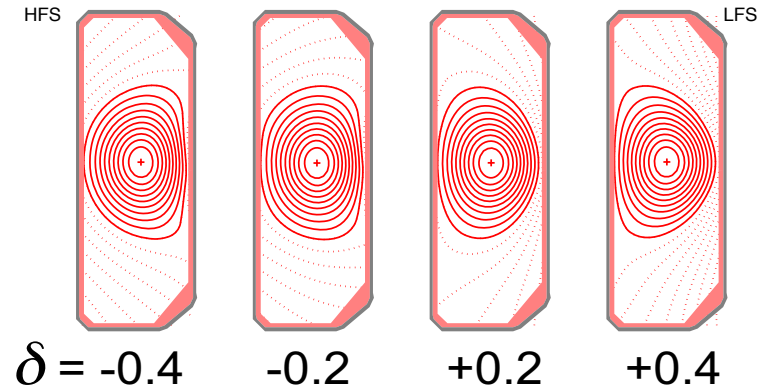
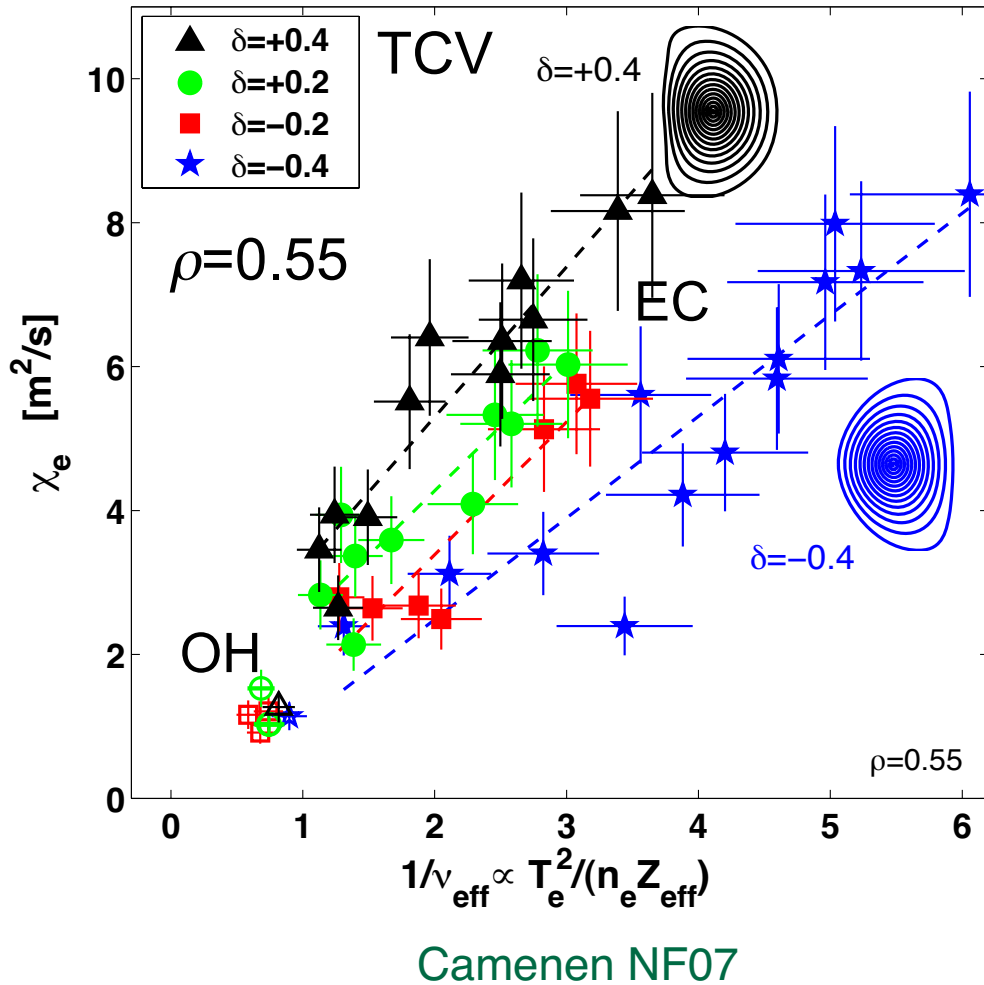

Plasma Turbulence studied by means of Correlation-ECE in the TEM domain in TCV

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S.Brunner, Y.Camenen, S.Coda, T.P.Goodman, J.Graves, S.Jolliet,
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Heat diffusivity modified by Shape δ & Collisionality ν_{eff} (TEM)



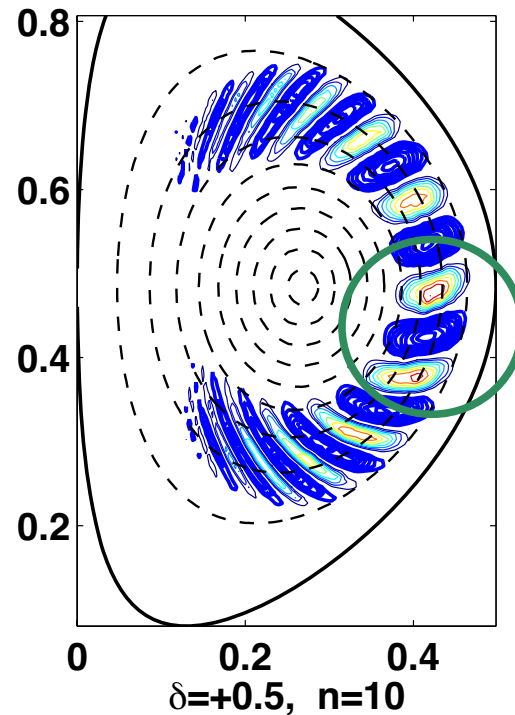
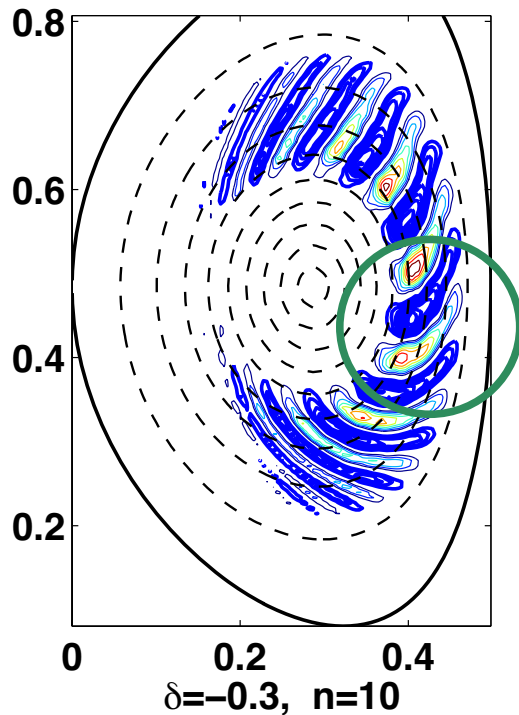
- Lower χ_e at $\begin{cases} \text{high collisionality } \nu_{\text{eff}} \\ \text{negative triangul. } \delta \end{cases}$
- Trends qualitatively reproduced by GS2 (local, flux tube, non-lin., $\rho \sim 0.7$), but radial dependence disagrees (global effects not taken into account!)

Marinoni PPCF 09

Global TEM simulations

LORB simulations (gyrokinetic, global, linear, no collisions)

electrostatic potential fluctuations



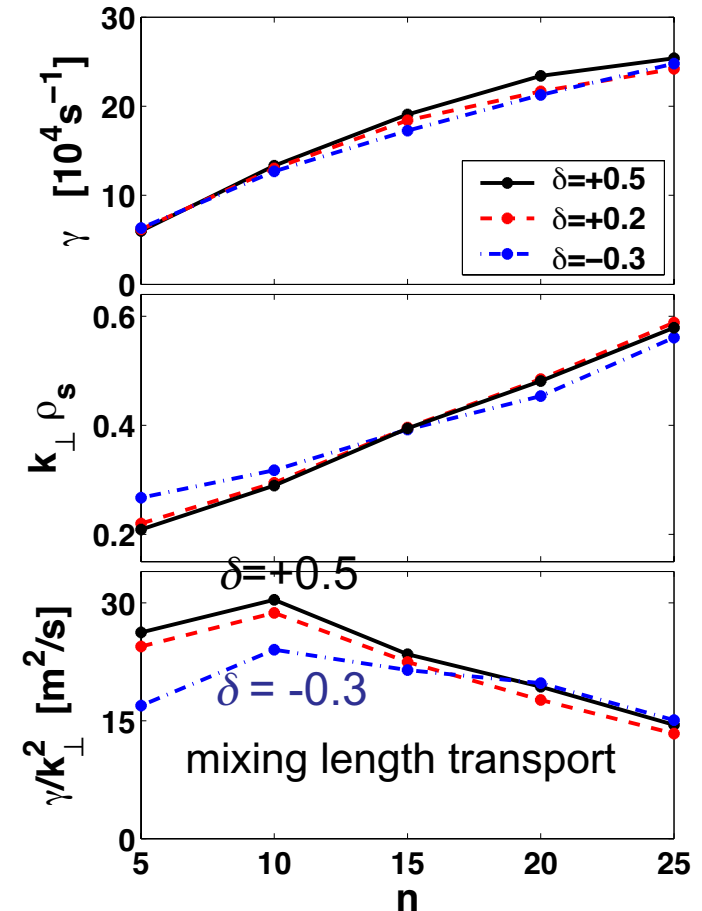
Camenen PPCF05

Negative $\delta < 0$:

-> stronger tilt of eddies at LFS equator!

-> higher k_{\perp}

-> lower mixing-length transport

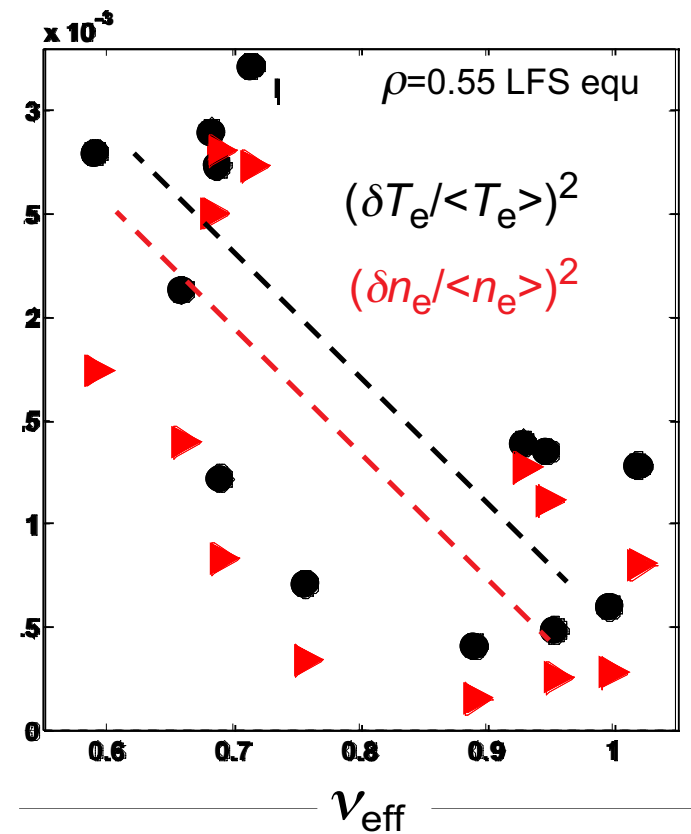
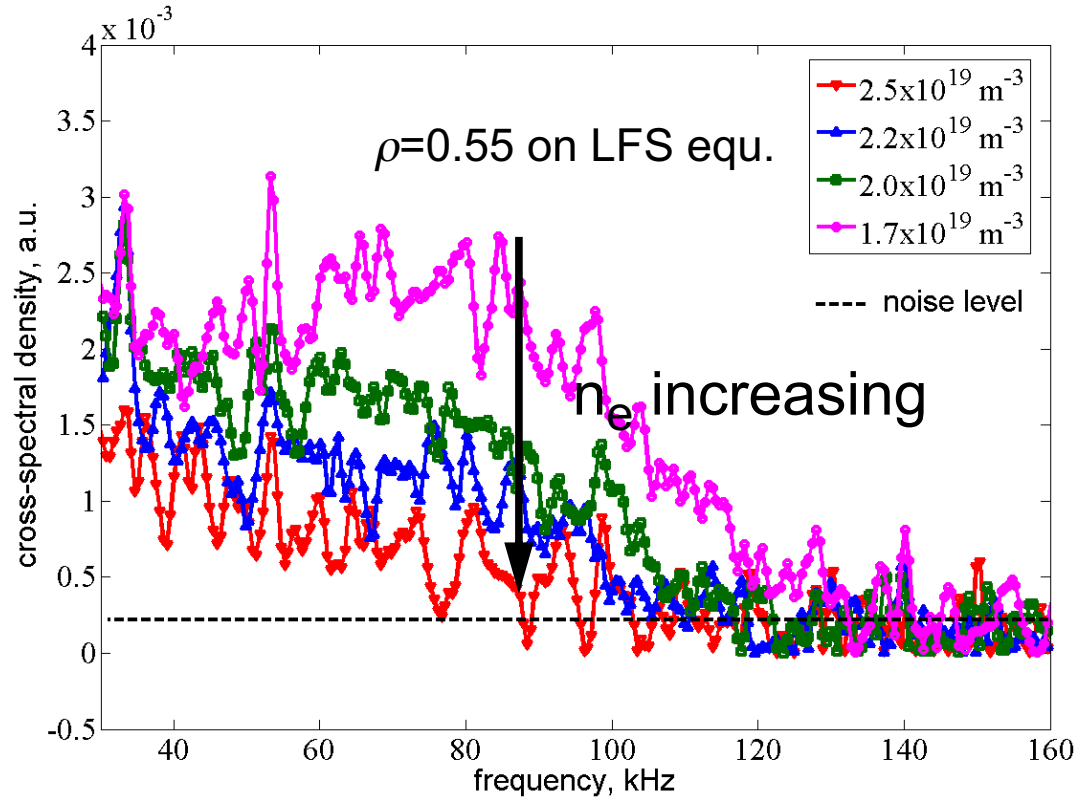


ORB5: for TEM: non-lin. results are close to linear Joliet Thesis 09

T_e -fluct. ampl. (corr-ECE diag.) decrease with ν_{eff} , as in GS2

T_e -fluctuation spectra decrease with density
from expt. Ohmic, $q \sim 10$, $\kappa \sim 1.4$, $\delta \sim 0.3$

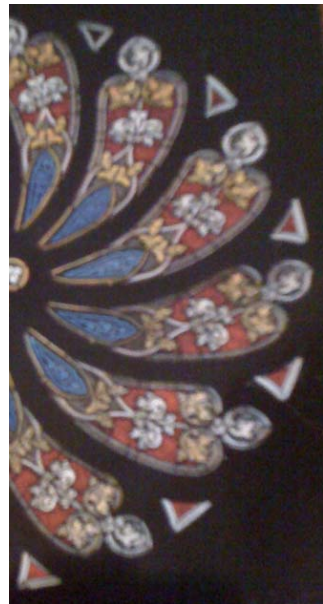
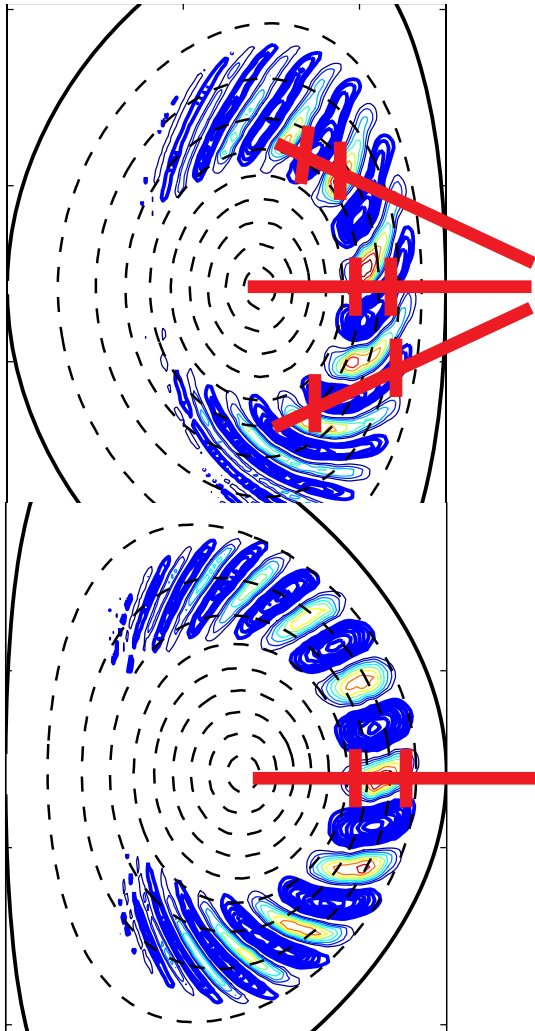
T_e - & n_e -fluctuations from GS2 decrease with ν_{eff}
(as in experiment)



consistent with TEM ampl. reduction with collisions (e^- collisional detrapping)

Udintsev, Fable US-TTF09

What will we find at the turbulence level?



stained-glass
window
Basel cathedral

With correlation-ECE, investigate:

- Spatial structure of turbulence
radial structures with size $\Delta\rho > 10\%$ seen
- Changes expected with e.g. triangularity
 k_{\perp} , orientation of cells, ...
- Shaping: a tool to vary continuously
transport parameters
 - helpful to test models
 - and compare with gyro-kinetic codes
- How close are expts from linear/non-linear global gyro-kinetic simulations?