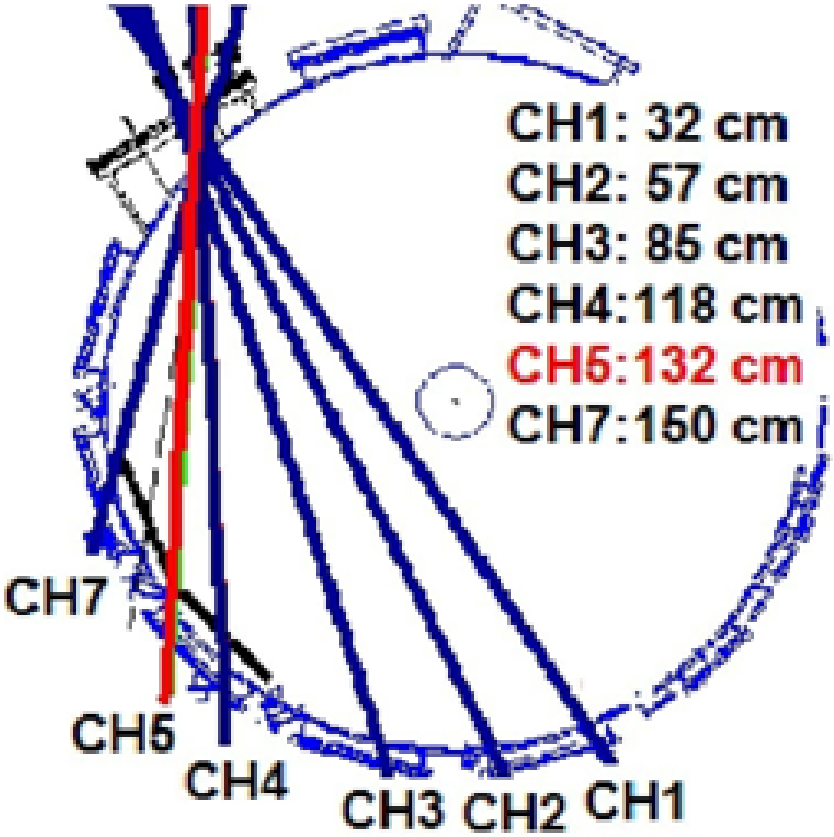
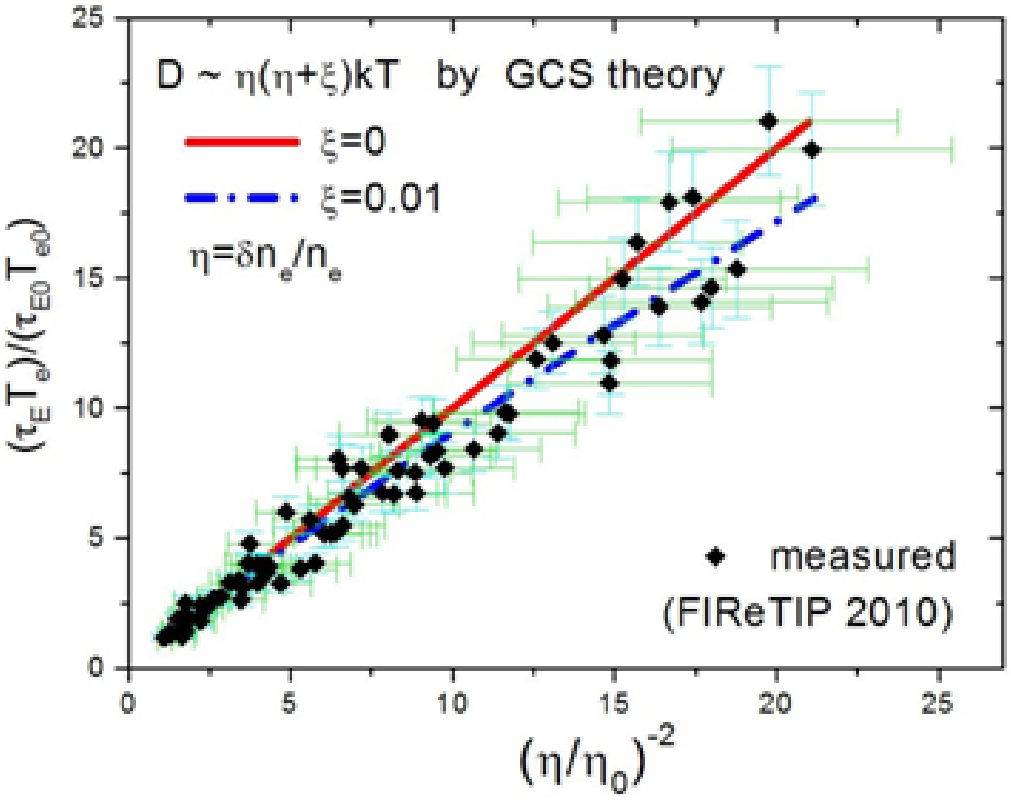
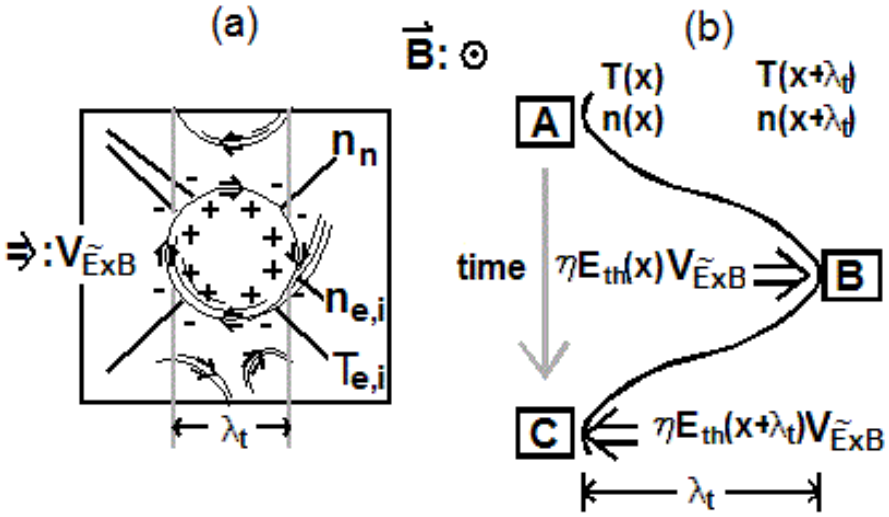
2010 FIReTIP density fluctuation data showed

$$D \sim \eta^2 kT$$







Thermal energy transport

$$\Gamma_E = \frac{\eta}{\pi}\frac{\tilde{E}\lambda_t}{B}(kT_0 n' + kn_0 T')$$

$$kT_0 n' + kn_0 T' = d(nkT)/dx$$

with Boltzmann relation; $e\tilde{E}\lambda_t / 2kT_i = \eta$

$$\Gamma_E = D_E E'_{th}$$

$$D_E = \frac{2}{\pi}\eta^2 \frac{kT_i}{eB}$$

(E_{th} = thermal energy)

	x	$x+\lambda_t$
n : density	n_0	$n_0 + \lambda_t n'$
T : temperature	T_0	$T_0 + \lambda_t T'$
$nT:[A]$	$(nT)_x = n_0 T_0$	$(nT)_{x+\lambda} = n_0 T_0 + \lambda_t n_0 T' + \lambda_t T_0 n' + \lambda_t^2 n' T' \approx n_0 T_0 + \lambda_t n_0 T' + \lambda_t T_0 n'$
$nT:[B]$	$n_0 T_0 - \eta n_0 T_0$	$n_0 T_0 + \lambda_t n_0 T' + \lambda_t T_0 n' + \eta n_0 T_0$
$nT:[C]$	$n_0 T_0 - \eta n_0 T_0 + \eta n_0 T_0 + \eta\lambda_t n_0 T' + \eta\lambda_t T_0 n' + \eta^2 n_0 T_0 \approx (nT)_x + \eta\lambda_t n_0 T' + \eta\lambda_t T_0 n'$	$n_0 T_0 + \lambda_t n_0 T' + \lambda_t T_0 n' + \eta n_0 T_0 - \eta n_0 T_0 - \eta\lambda_t n_0 T' - \eta\lambda_t T_0 n' - \eta^2 n_0 T_0 \approx (nT)_{x+\lambda} - \eta\lambda_t n_0 T' - \eta\lambda_t T_0 n'$

However, particle transport showed separate character from temperature profile in NSTX such as

(1) Ear structure of H-mode

(2) Temperature rise of EPH -mode

FIReTIP density measurement