

## Examples of High Performance Discharges at W7-AS

W7-AS Team

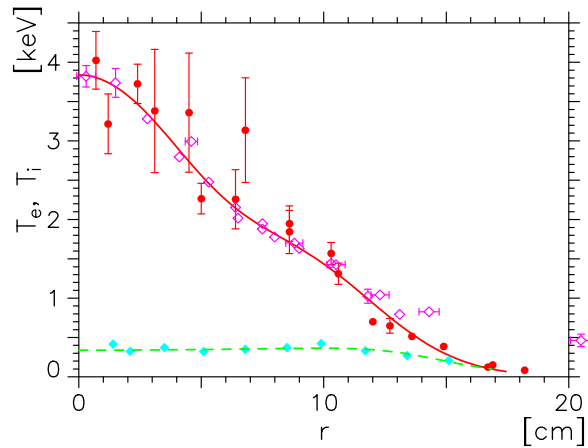
*Max-Planck Institut für Plasmaphysik, TI Greifswald,*

*IPP-EURATOM Association, Germany*

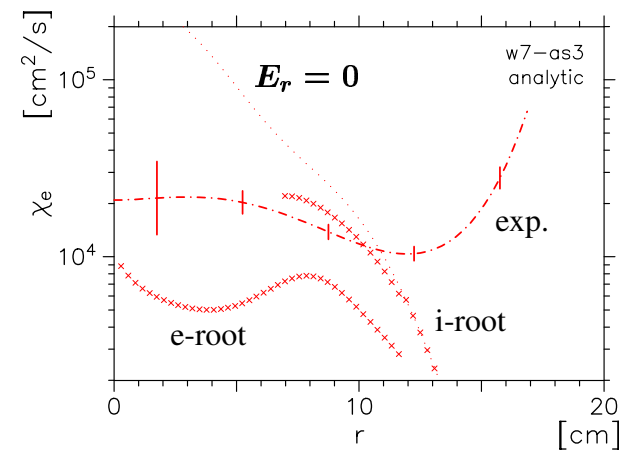
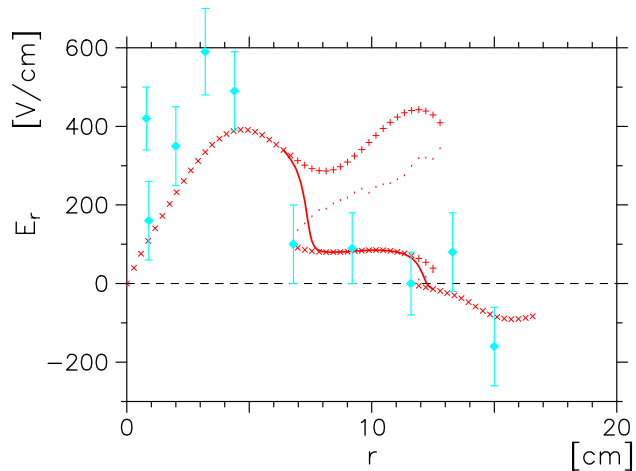
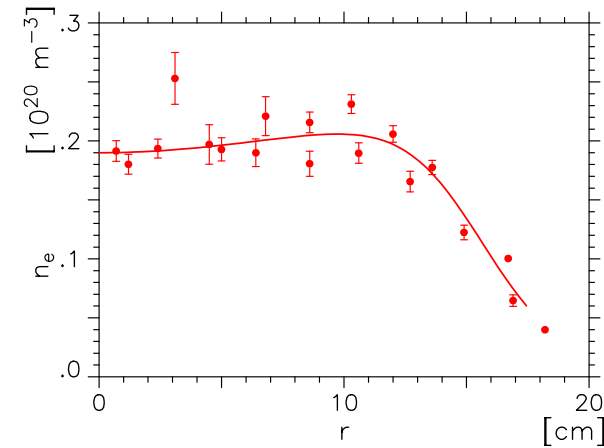
# W7-AS: CERC (“e-root”) discharge



shots 36908 ...



770 kW X2-ECRH discharges

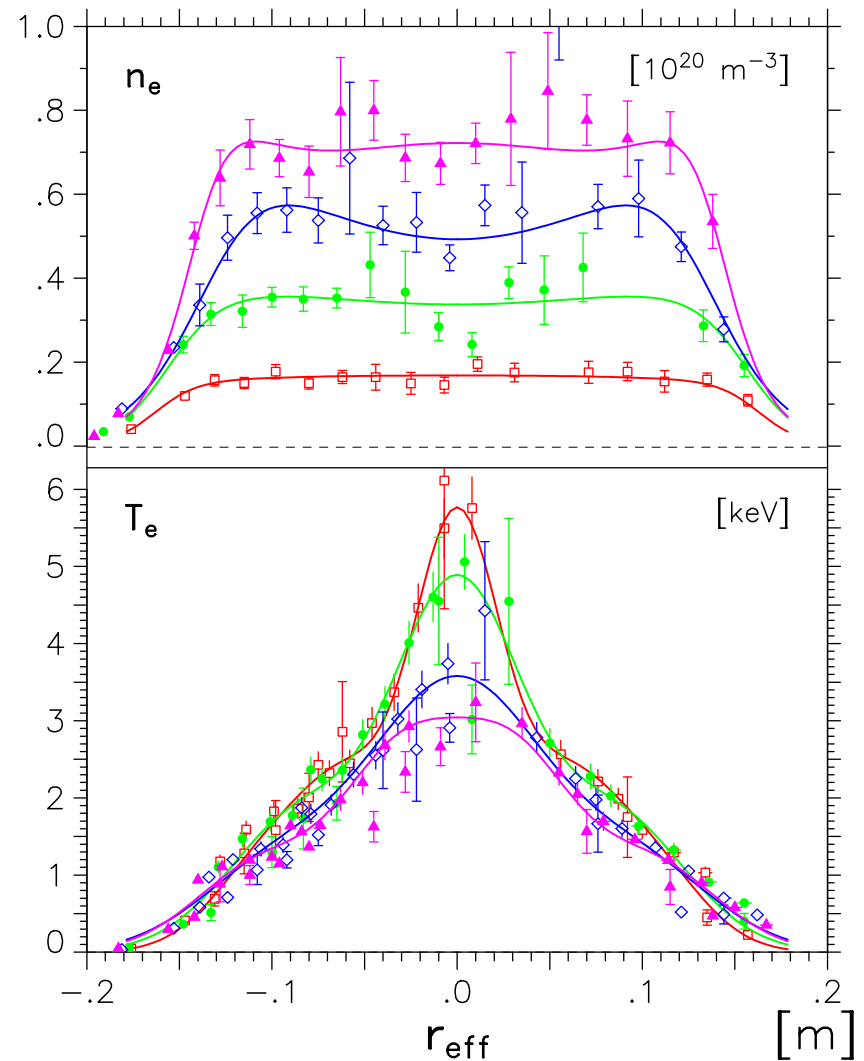
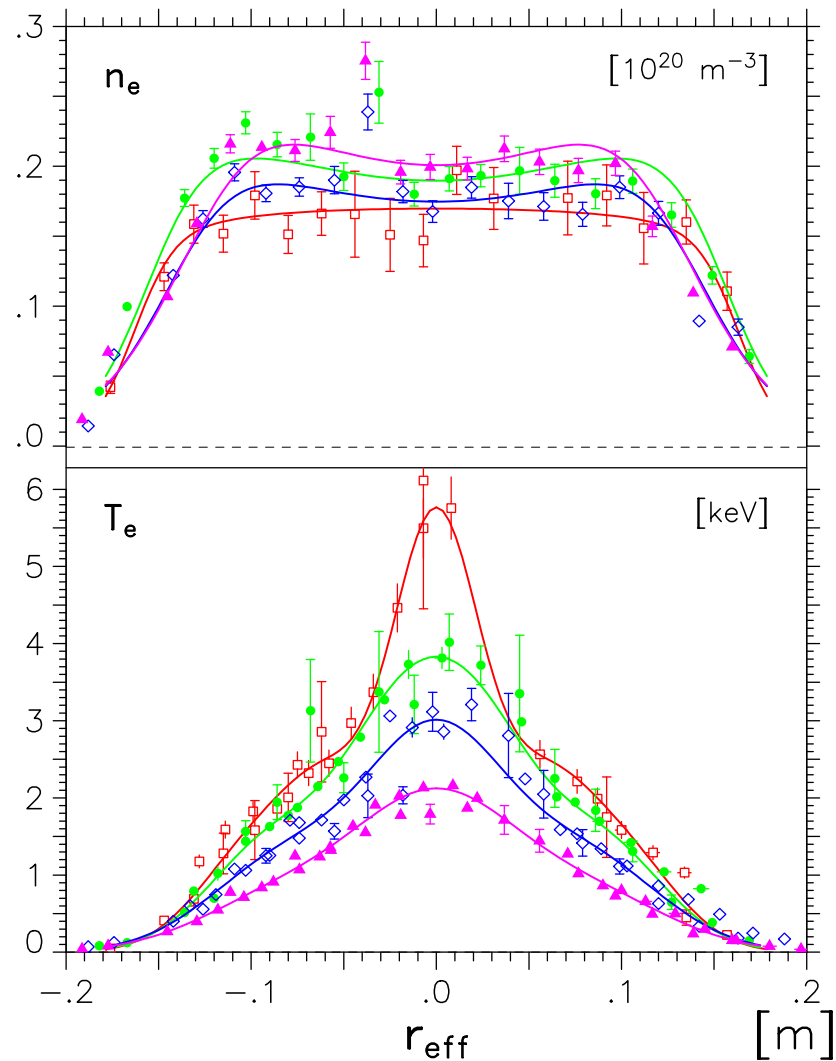


$T_e(r)$  and  $T_i(r)$ ,  $n_e(r)$  (upper), ambipolar  $E_r(r)$  and  $\chi_e(r)$  (lower row)

# W7-AS: CERC - power and density scan

$0.2 \text{ MW} < P_{\text{ECRH}} < 1.2 \text{ MW}$

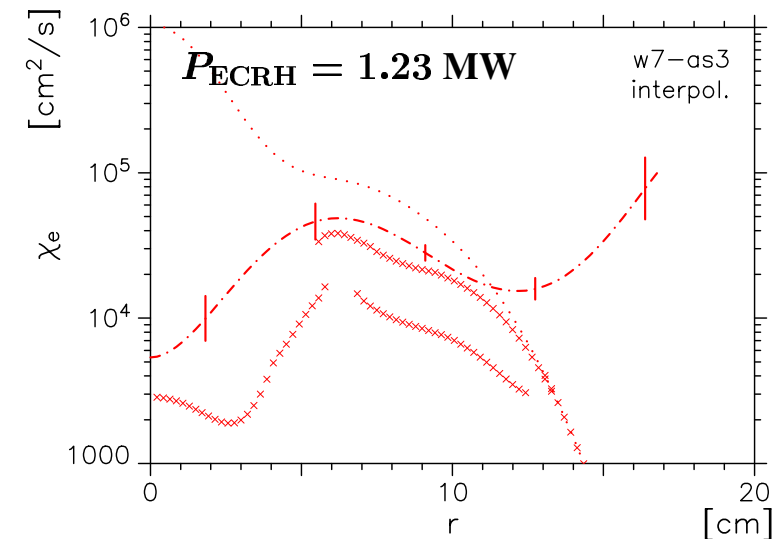
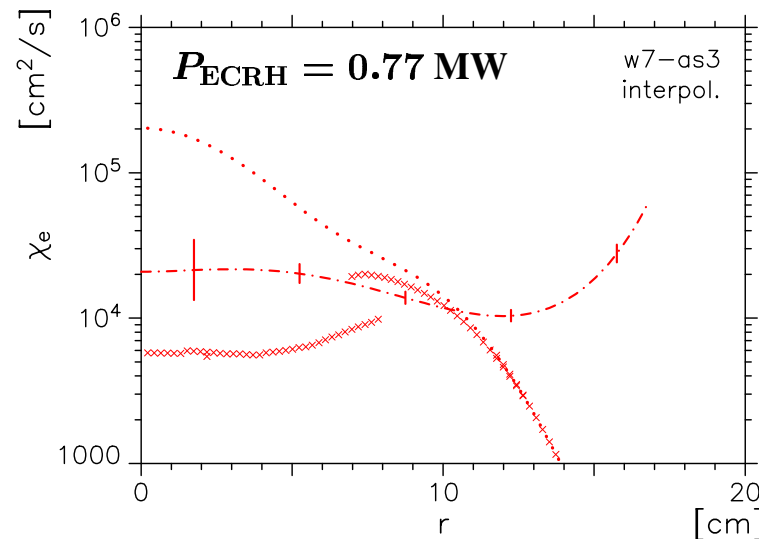
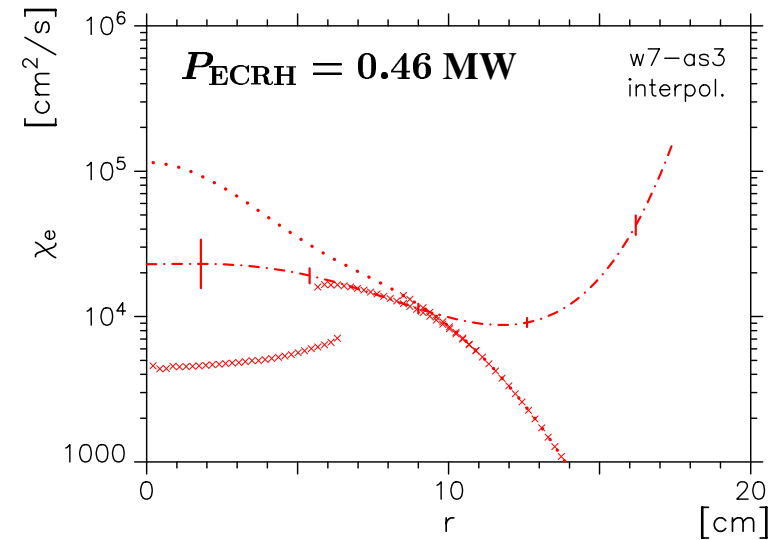
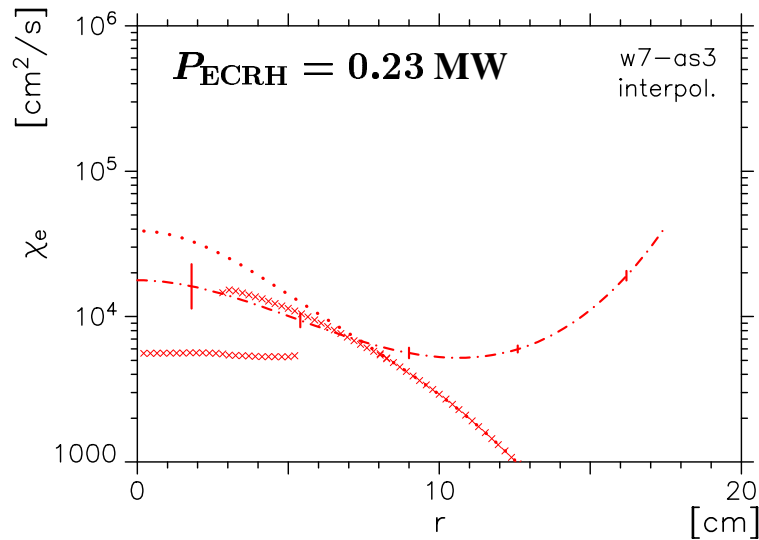
"standard" configuration,  $\tau_a \simeq 0.34$



# W7-AS “electron-root”: $\chi_e$ in ECRH power scan



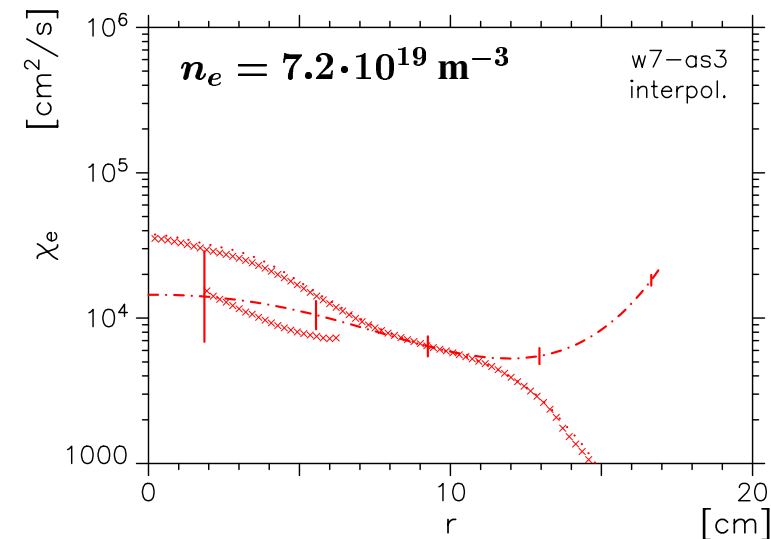
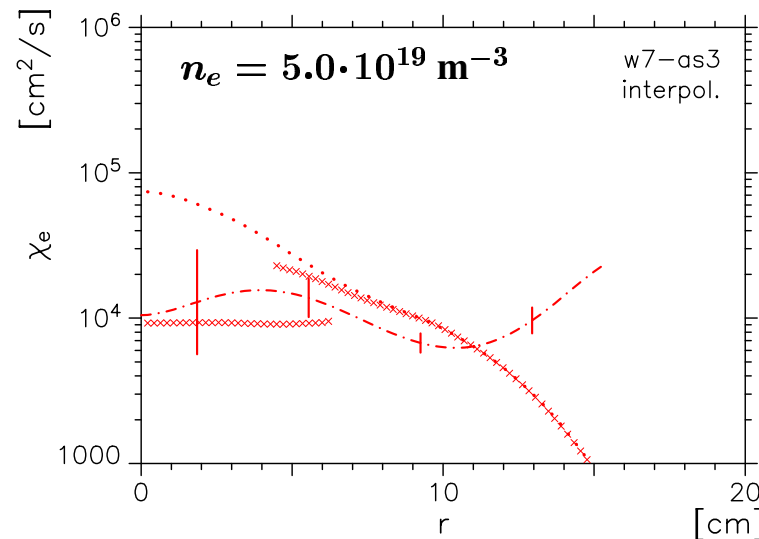
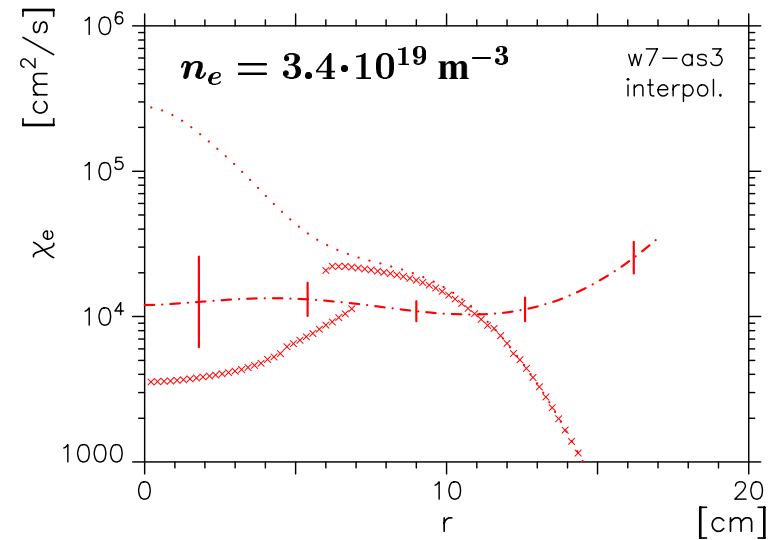
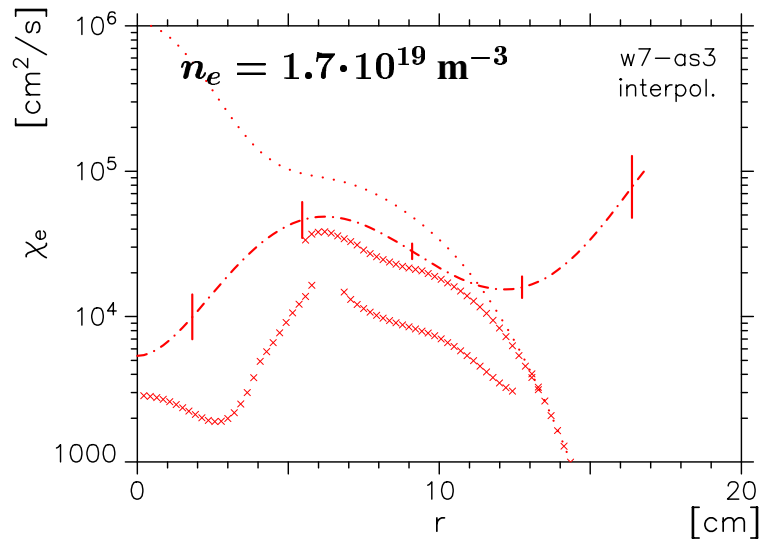
$n_e \simeq 2 \cdot 10^{19} \text{ m}^{-3}$ ; X2-mode; “standard” conf.;  $t_a \simeq 1/3$



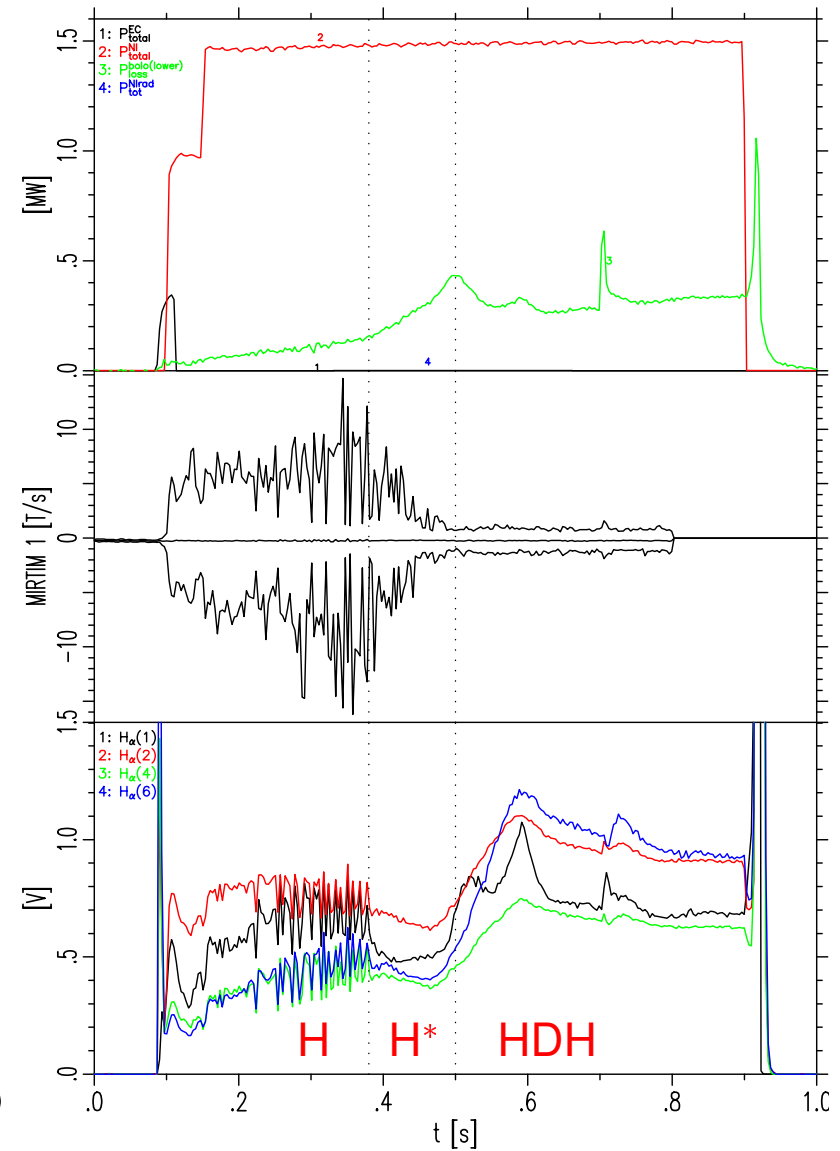
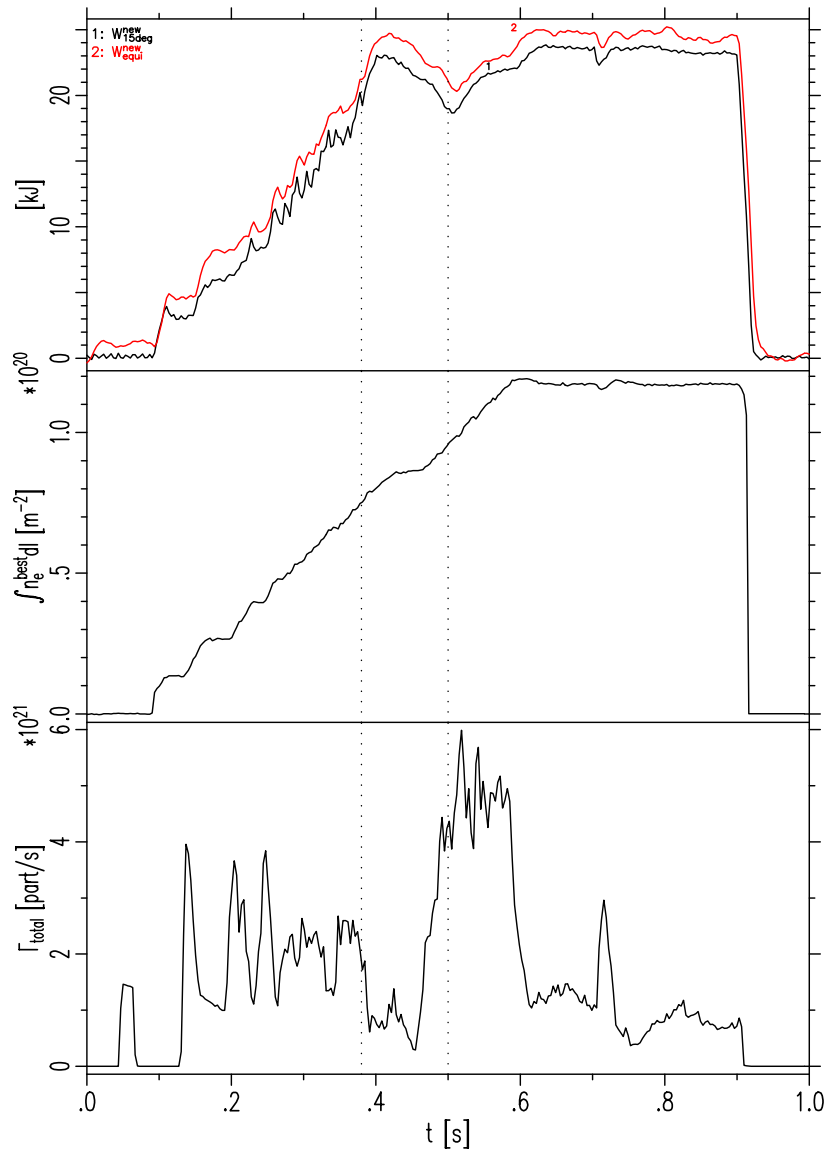
# W7-AS “electron-root”: $\chi_e$ in ECRH density scan



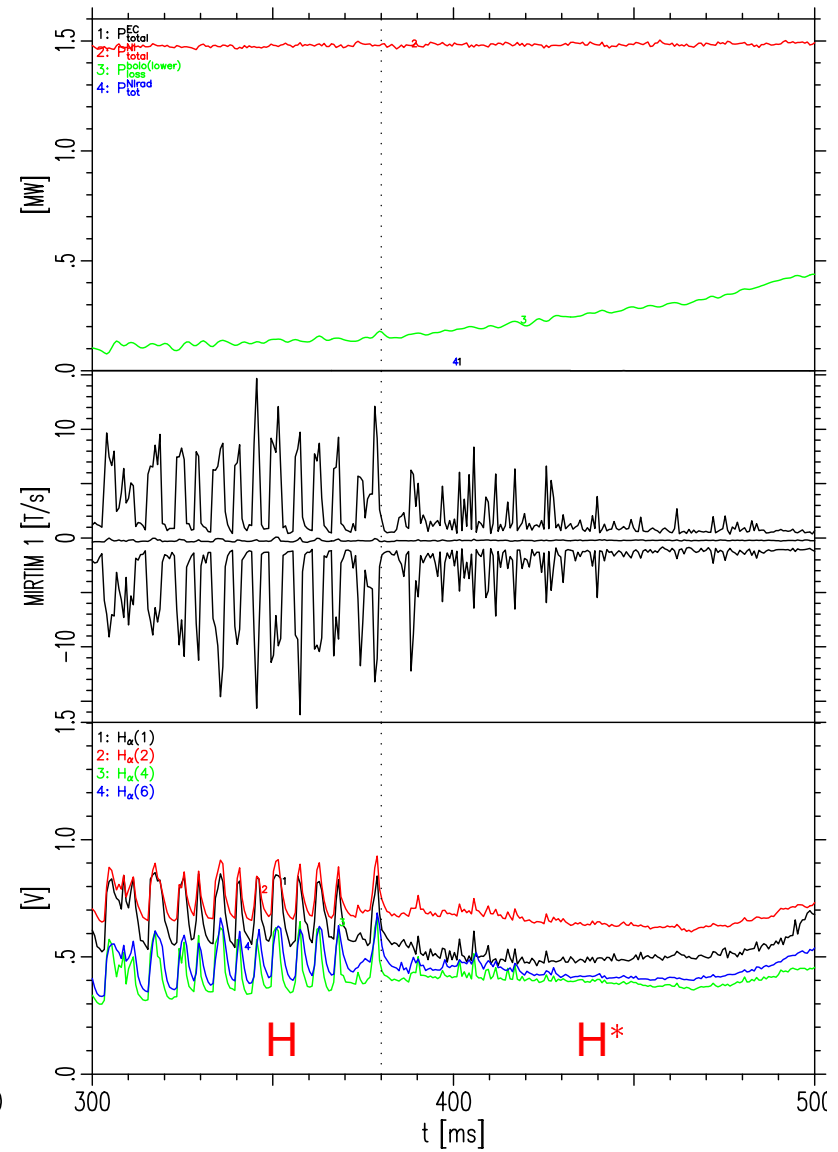
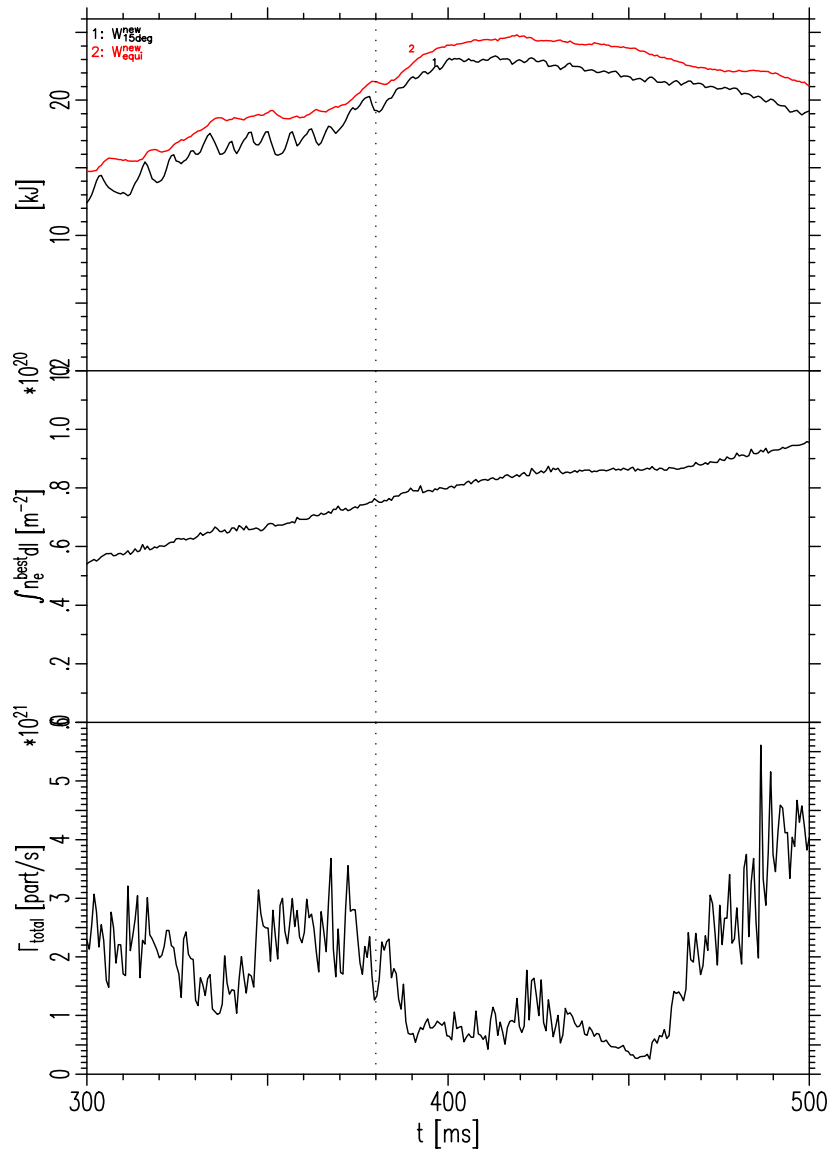
$P_{\text{ECRH}} = 1.2$  MW in X2-mode; “standard” conf.;  $t_a \simeq 1/3$



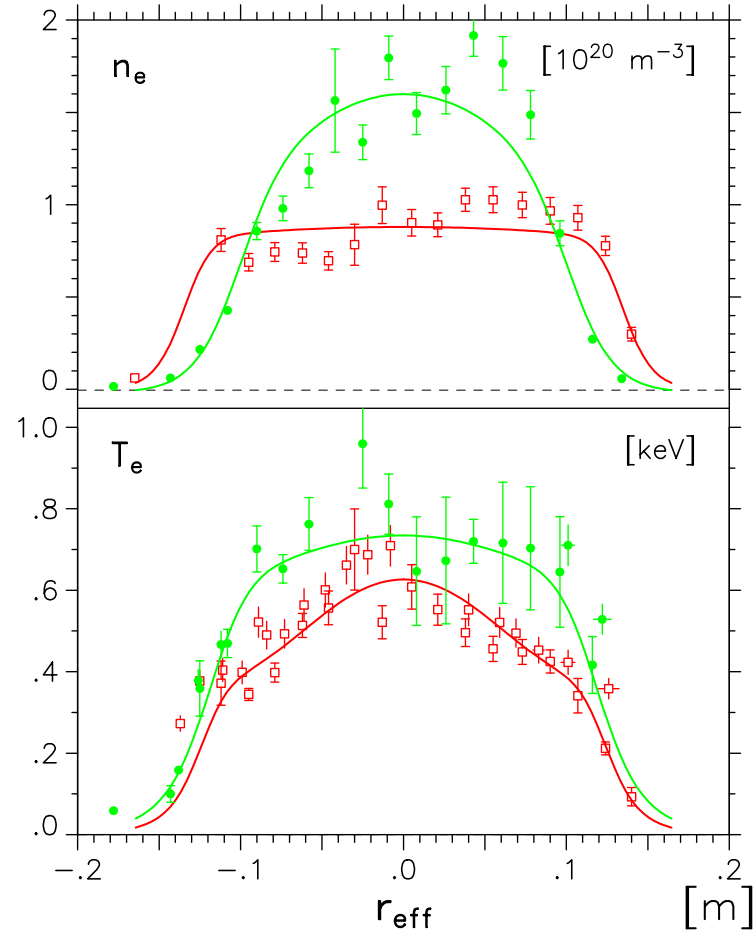
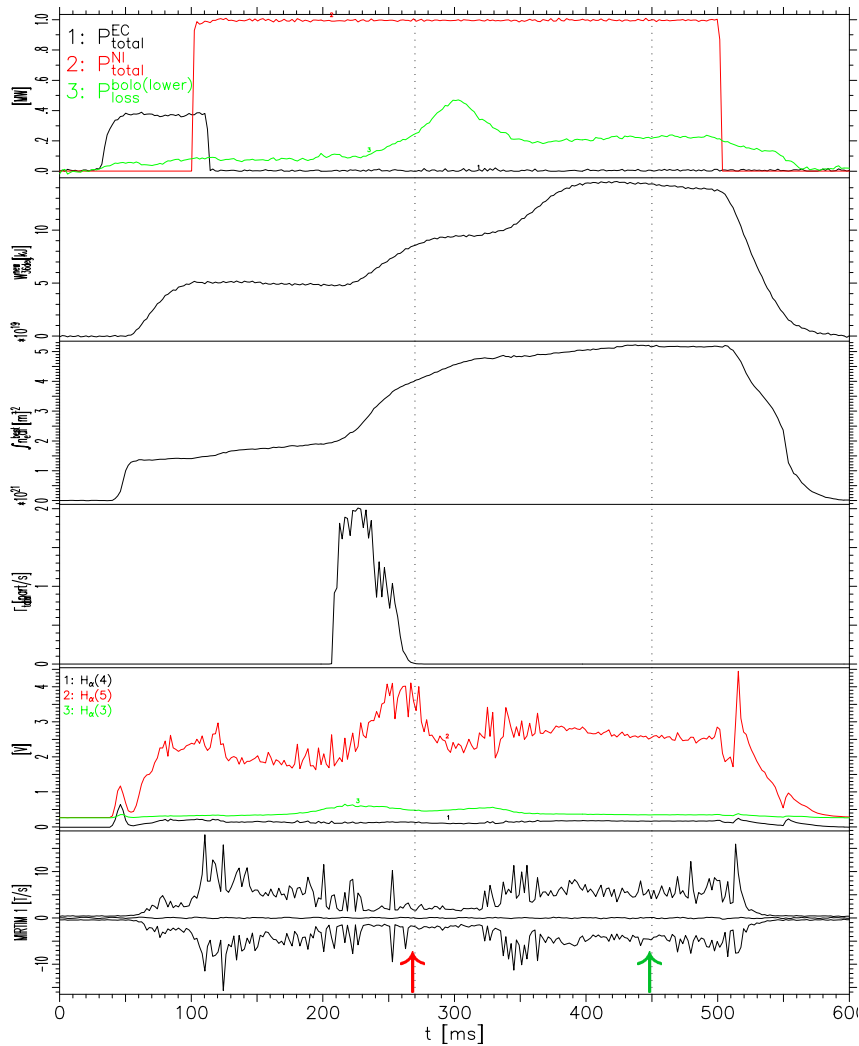
# W7-AS: $H \rightarrow H^* \rightarrow HDH$ mode (shot 56156)



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# W7-AS: $\tau_E$ and $n_e$ -profile shape (shot 43640/43)

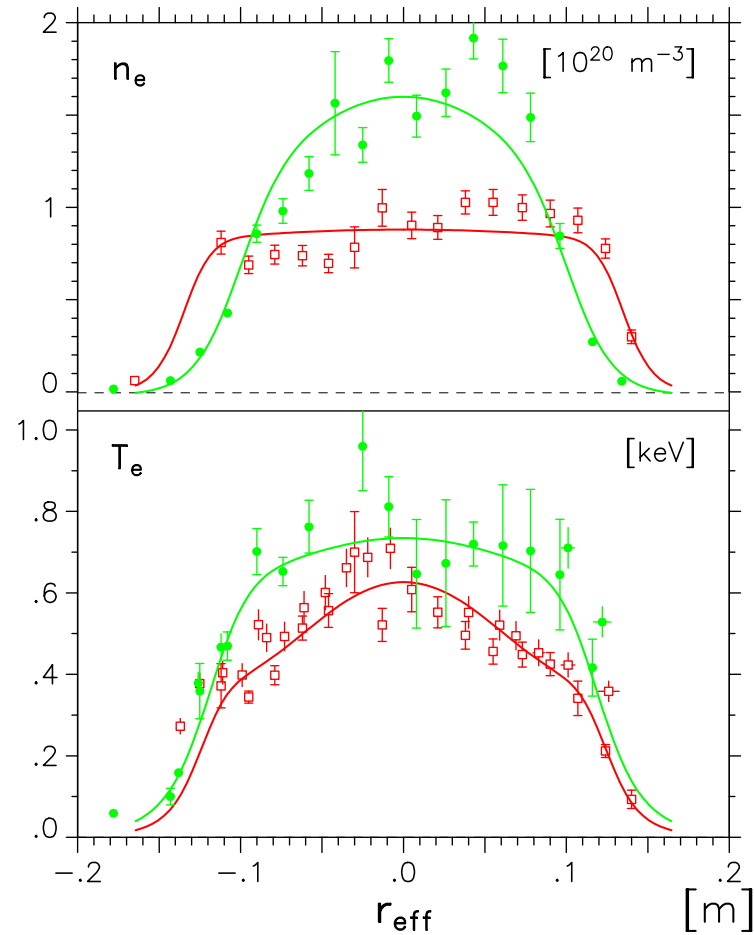
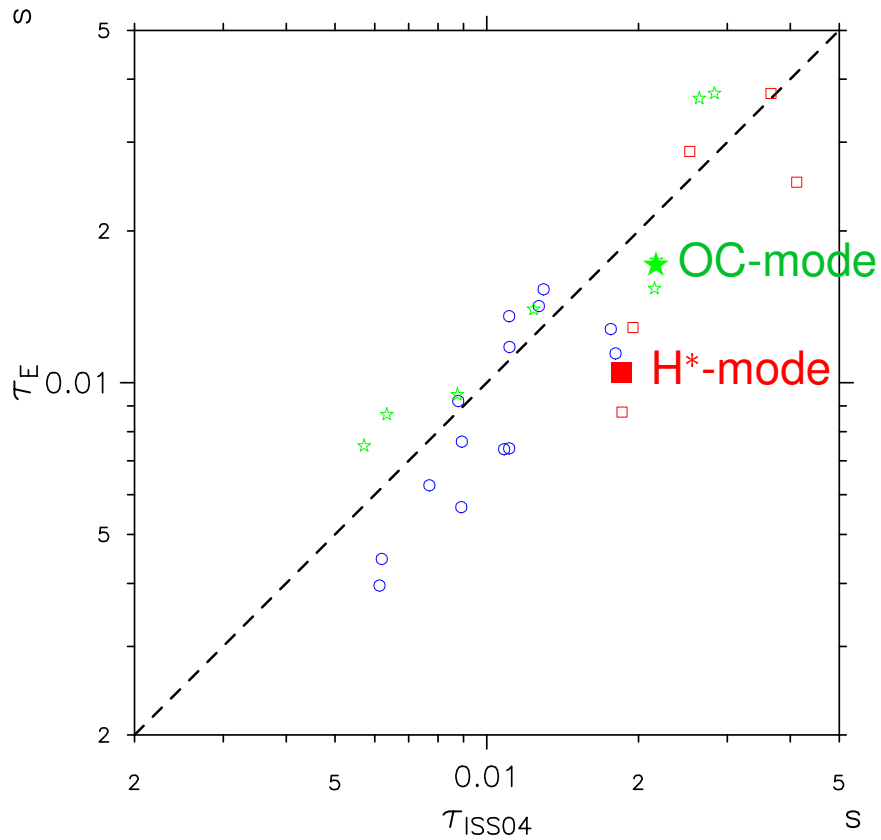


at 0.27 s: H\*-mode

at 0.45 s: OC-mode



# W7-AS: $\tau_E$ and $n_e$ -profile shape (shot 43640/43)



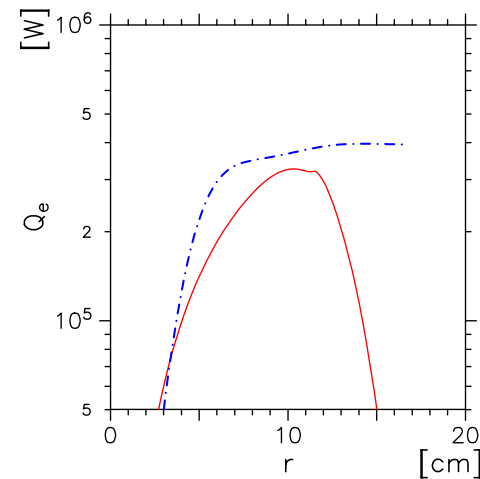
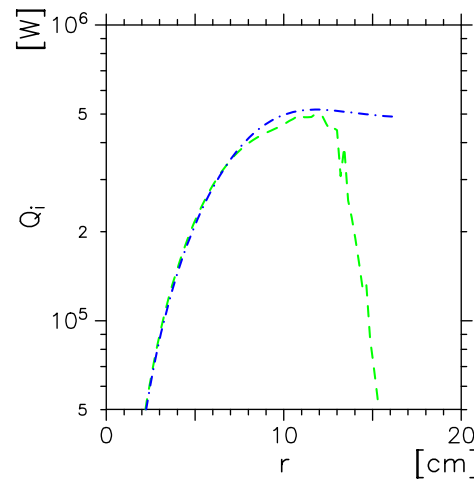
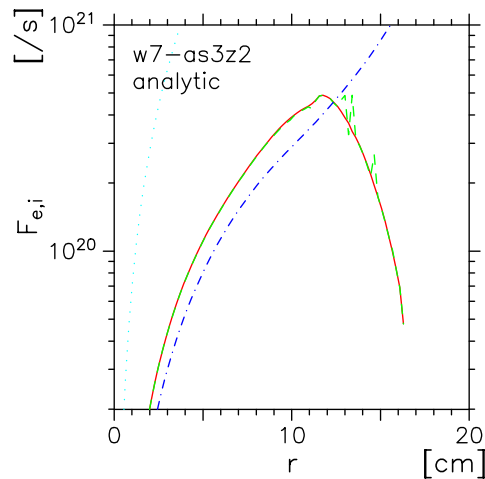
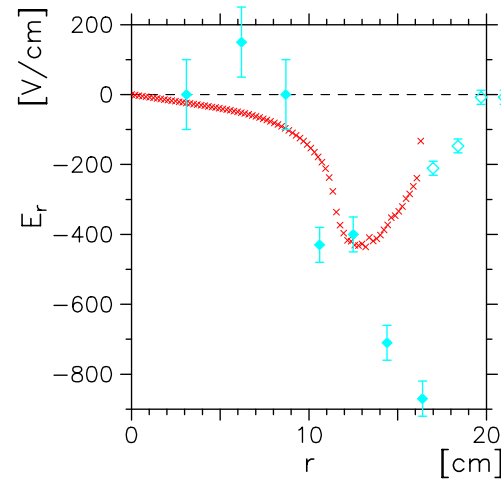
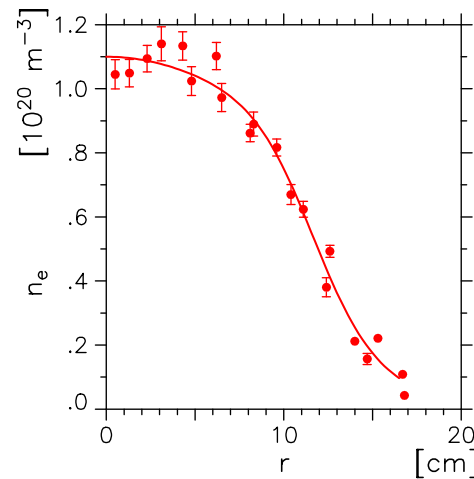
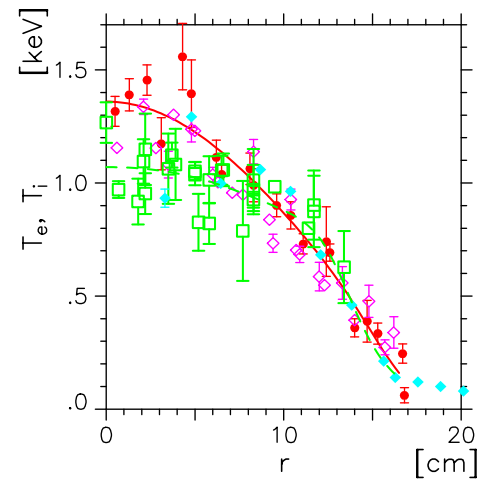
at 0.27 s: H\*-mode

at 0.45 s: OC-mode

# W7-AS: neoclassical transport analysis



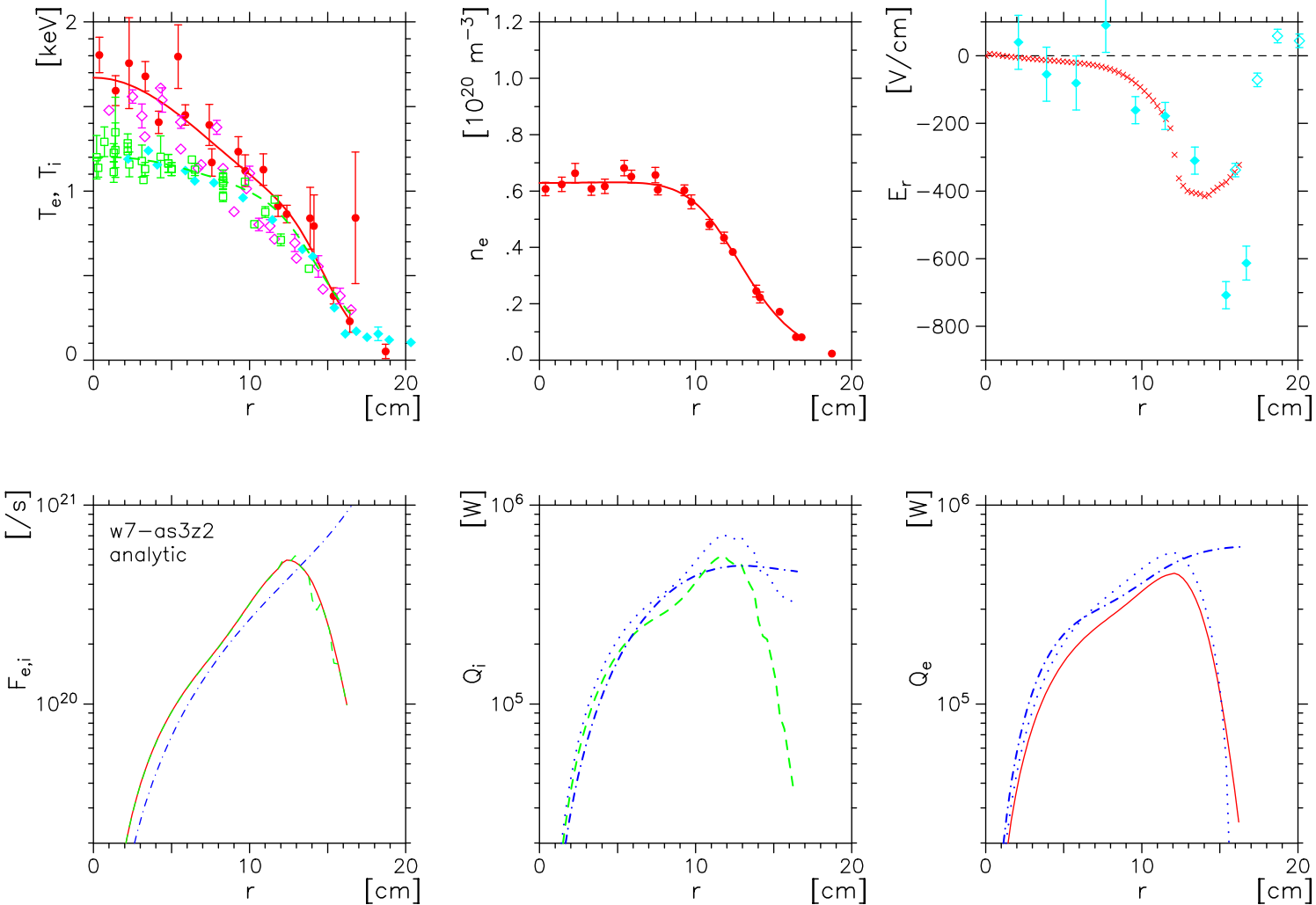
shot 34609      absorbed power: 830 kW NBI, 330 kW ECRH



# W7-AS: neoclassical transport analysis



shot 34313      absorbed power: 680 kW NBI, 750 kW ECRH



# W7-AS: $\tau_E$ for “optimum confinement”

