KSTAR Overview
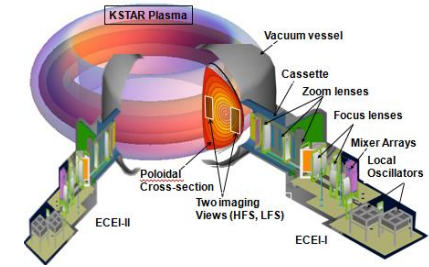
- ❑ Expansion of plasma operation window into steady-state high performance plasma
  - o Long pulse H-mode up to 55sec
  - o high β_N (β_N >3, 3 sec) and high β_P (β_P > 3, 12s)
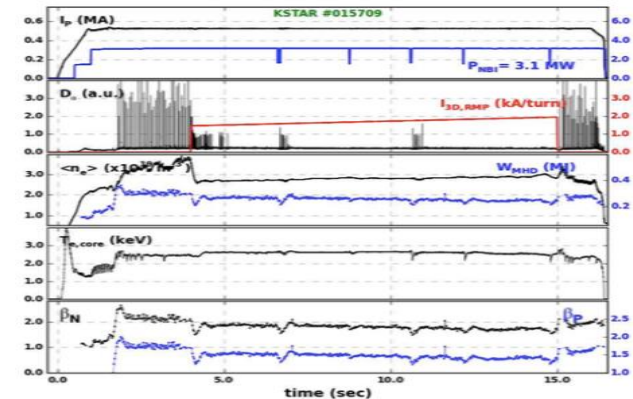 - o Low q95 (q95 <2.3) in H-mode

- ❑ Outstanding 3D field research capability & perfect ELM-crash suppression
  - o Extremely low intrinsic error ($\delta B/B0 \sim 1 \times 10^{-5}$)
  - o Flexible in-vessel coils in 3 rows, T/M/B)
  - o Robust and stationary ELM-crash suppression by n=1 RMP over 10s
  - o Dependence of error field on L-H transition threshold

- ❑ Among many physics unveiled on KSTAR
  - o MHD criteria for sawtooth instability
  - o Fundamentals of the Edge Localized Mode

Advanced 3D coil and imaging diagnostics

KSTAR In-vessel Control Coils (IVCC): Top/Mid/Bot
H.K. Kim et al, FED (2009)

ELM-crash Suppression > 10s

KSTAR #015709

Visualization of sawtooth evolution with ECEI