

# (SG2, TC) Session Report

April 5, 2024 (M.Yoshinuma)

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**Date:** April 4, 2024

**Time:** 14:45 – 16:45

**Shot#:** 188947 – 188988 ( 42 shots)

**Prior wall conditioning:** None

**Divertor pump:** Off

**Gas puff:** H<sub>2</sub>

**Pellet:** None

**NBI#(1, 2, 3, 4, 5) = gas(H, H, H, H, H)=P(3.7, 3.8, 3.9, 3.0, -) MW**

**ECH(77GHz) = ant(5.5-U, 2-OUR, 1.5Uo)=P(698, 380, -) MW**

**ECH(154GHz) = ant(2-OLL, 2-OUL, 2-OLR)=P(-, -, -) MW**

**ICH(3.5U, 3.5L, 4.5U, 4.5L) = P(-, -, -, -) MW**

## Topics

1. Assessment of geometrical effect on transport through quadrupole field scan( H. Yamada)

# Assessment of geometrical effect on transport through quadrupole field scan

H.Yamada, N. Tamura  
K.Tanaka, T.Tokuzawa,  
M.Yoshinuma, K.ida et al.

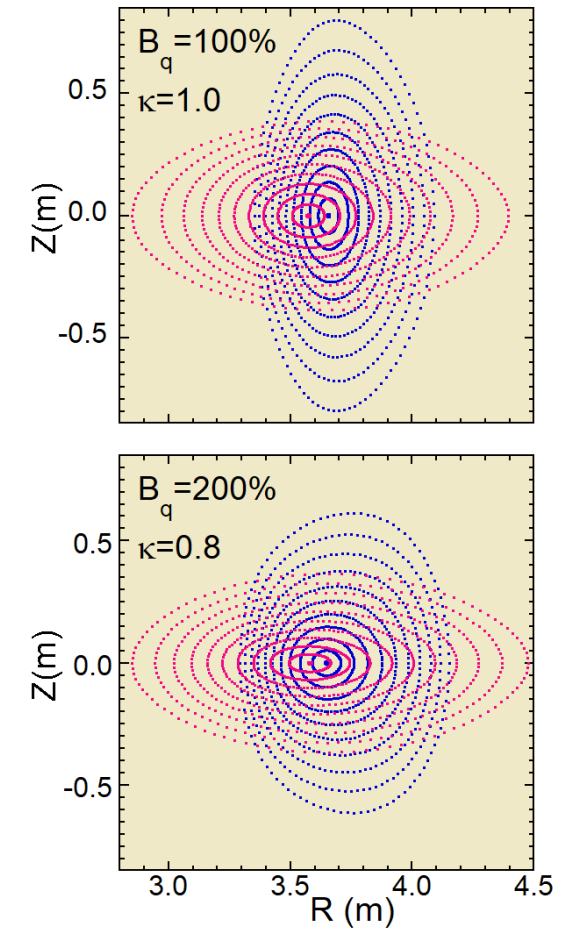
**Experimental conditions:**  $(R_{ax}, \text{Polarity}, B, \gamma, B_q) = (3.6 \text{ m}, \text{CCW}, 1.375 \text{ T}, 1.2538, \underline{200\%})$   
**Shot #:** 188947 - 188988

## Background and motivation:

- This study revisits [the assessment of geometrical effect due to elongation](#) on transport [with much more enriched/matured diagnostics](#) and tools than the previous study in 2003-2004.
- **Elongation  $k$**  can be controlled **from 0.8 to 1.4** by changing  $B_q=200\%-0\%$
- **Elongation scan** by means of quadrupole field would be a clever way to extract the effect of **geodesic curvature**, **trapped particle fraction**, etc. compared with the magnetic axis scan which changes a variety of physical properties.

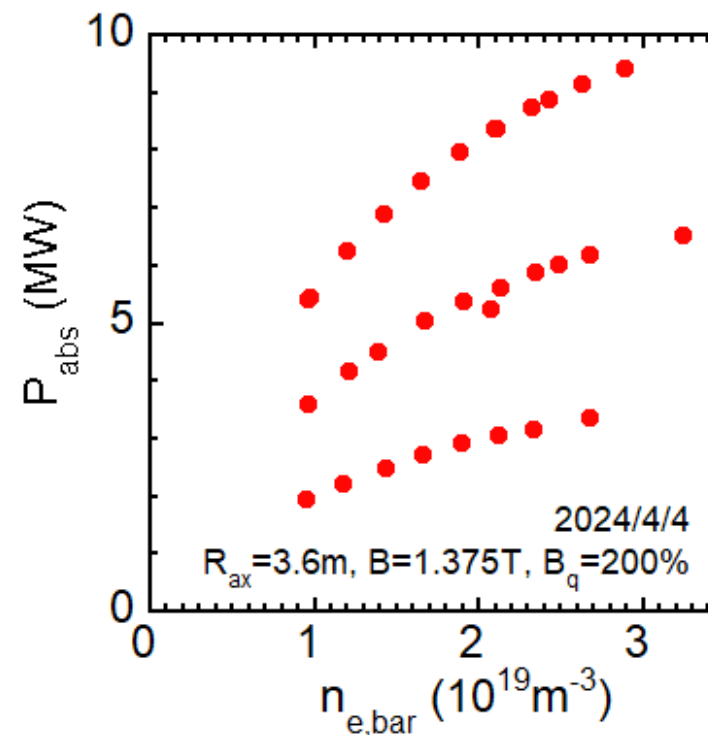
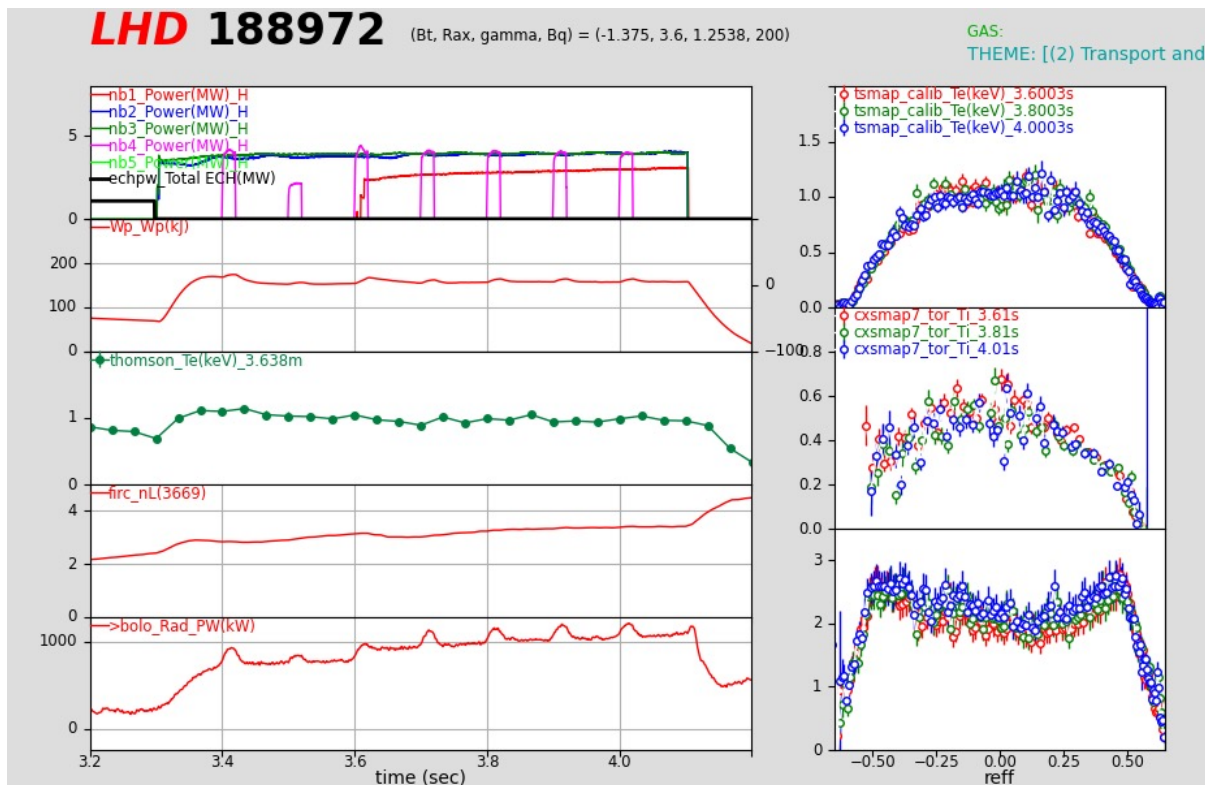
## Subject on this day:

- Compilation of data in the case of  $B_q=200\%$  (oblate configuration)
- Data are to be compared with the case with  $B_q=0\%$  (prolate configuration) and  $B_q=100\%$  (standard but the minor radius is adjusted to the same by  $\gamma = 1.174$ ) planned on May 1.



# Assessment of geometrical effect on transport through quadrupole field scan

- For the oblate configuration ( $B_q=200\%$ ), density and absorbed power of NBI were scanned in the ranges of  $0.9-3.2 \times 10^{19} \text{m}^{-3}$  and 1.9 – 9.4 MW.



Scanned regime in density and absorbed heating power of NBI

- Documentation of confinement/transport characteristics together with density fluctuation (PCI,  $\mu$ -wave scattering, reflectometer) will be done.
- Dataset will be combined with the cases with  $B_q=0\%$  and  $100\%$  ( $\gamma=1.174$ )