

(TG3) Spectroscopy Topical Group Report



Nov. 5, 2021 (M. Yoshinuma)

Date: Nov. 4, 2021

Time: 15:41 – 18:41

Shot#: 171801 – 171858 (58 shots)

Prior wall conditioning: NO

Divertor pump: ON (except 2-I section)

Gas puff: D₂, Ar

Pellet: TESPEL

NBI#(1, 2, 3, 4, 5) = gas(H, H, H, D, D)=P(4.4, 4.4, 3.7, 5.0, 5.2) MW

ECH(77GHz) = ant(5.5-Uo(1.5-Uo), 2-OUR)=P(703, 792) kW

ECH(154GHz) = ant(2-OLL, 2-OUL, 2-OLR)=P(979, 930, 986) kW

ICH(3.5U, 3.5L, 4.5U, 4.5L) = P(0.88, 0.69, 1.0, 0.56) MW

Neutron yield integrated over the experiment = 8.1×10^{15}

Topics

1. Multi-tracer Impurity transport studies by TESPEL injections into multi-ion plasmas (R. Bussiahn, N.Tamura)

Multi-tracer-impurity transport studies by TESPEL in multi-ion plasmas (R. Bussiahn & N. Tamura et al.)

Experimental conditions: (R_{ax} , Polarity, B_t , γ , B_q) =
(3.60 m, CCW, 2.75 T, 1.2538, 100.0%)

Goal of this experiment:

- Systematic studies of the multi-tracer-impurity transport in multi-ion plasmas under different plasma conditions
 - ✓ Electron density and temperature
 - ✓ NBI/ECH ratio
- Comparisons with the results in W7-X

Results:

- **(Ti/Fe/Cu)-, (Ti/Fe/Cu/Mo)-TESPEL has been injected** into the balanced(#2+#3)-NBI heated plasmas with a various density, from $1E19\text{ m}^{-3}$ to $5E19\text{ m}^{-3}$
- **1x, 2x, 3x154 GHz ECH were added** for one second (1 s) immediately after the TESPEL injection (see right figures)
 - ✓ In the high-density cases, impurity emissions have been observed for a long time in the plasma w/o 154 GHz ECH
 - ✓ **When the power of 154 GHz ECH increases, the decay time of impurity emissions decreases**

SOXMOS data

Y: wavelength (nm)
X: time (s)

