

(TG3) Spectroscopy Topical Group Report



Feb. 16, 2022 (M. Yoshinuma)

Date: Feb. 10, 2022

Time: 12:30- 16:00

Shot#: 178783 – 178841 (59 shots)

Prior wall conditioning: -

Divertor pump: ON (w/o 2I)

Gas puff: H, N, Ne, Ar

Pellet: -

NBI#(1, 2, 3, 4, 5)=gas(H, H, H, H, H)=P(2.0, 1.2, 1.8, 3.9, 3.8)MW

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

ECH(154GHz)=ant(2-OLL, 2-OUL, 2-OLR)=P(723, 799, 825)kW

ECH(56GHz)=ant(1.5U)=P(-)kW

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

Neutron yield integrated over the experiment = 5.5×10^{10}

Topics

1. Ionization mean free path (Z) dependence of impurity retention in the ergodic SOL of LHD (V. Winters, M.Kobayashi)



Ionization mean free path (Z) dependence of impurity retention (screening) in the ergodic SOL of LHD

V. Winters, F. Reimold, M. Kobayashi, N. Tamura et al (10 Feb. 2022)

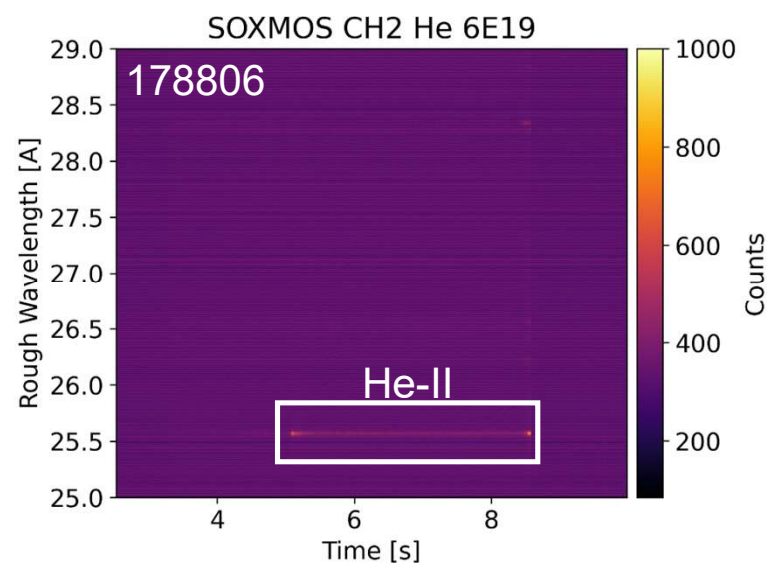
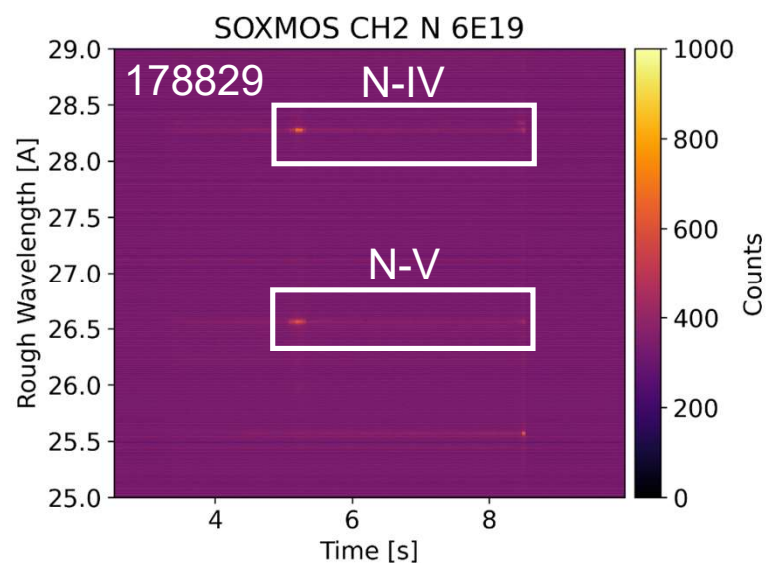
Motivation and Objectives:

Impurity screening has been observed for low ionization energy impurities (carbon and iron) at LHD and W7-X (carbon).

These experiments explore the effect that ionization energy has on impurity retention in the SOL of LHD, with comparison to the island SOL of W7-X. Impurities with higher ionization energies penetrate deeper into the SOL, possibly reducing the impurity retention.

Results:

He, Ne, Ar and N were puffed for different densities (1,3, 6 x 10¹⁹). Edge and core impurity emissions and profiles were measured by visible and EUV spectroscopy and CXS. Complete data set achieved for all impurities!





Ionization mean free path (Z) dependence of impurity retention (screening) in the ergodic SOL of LHD

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et al

Preliminary CXS data shows stronger decrease of N signal with density than He signal (impurity densities to be evaluated)

