(TG1) Multi-ion group report

Feb. 15, 2022 (M. Kobayashi)

Date: Feb. 10, 2022
Time: 11:18 -12:12
Shot#: 178764 – 178782 (19 shots)

Prior wall conditioning: No
Divertor pump: On
Gas puff: H2, He, Ne, N, Ar IPD: No
LID: Off
NBI#(1, 2, 3, 4, 5)=gas(H, -, H, H, He)=P(2.0, 1.2, 1.8, 3.9, 3.8) MW
ECH(77GHz)=ant(5.5-U, 2-OUR)=P(703, 792)kW
ECH(154GHz)=ant(2-OLL, 2-OUL, 2O-LR)=P(723, 799, 825) kW
ECH(116GHz)=ant(2O-LR)=P(-)kW
ECH(56GHz)=ant(1.5-U)=P(-)kW
ICH(3.5U, 3.5L, 4.5U, 4.5L) = P(-, -, -, -) MW
Neutron yield integrated over the experiment = 7.8×10^{10}

Topics
1. B_4C granule injection into NBI heated plasmas (R. Lunsford, S. Masuzaki)

B_4C granule injection into NBI heated plasmas

Continuation of IPD 250 μm B_4C experiment. Same material as injected into W7-X, showing elevated temps, stored energy, confinement time

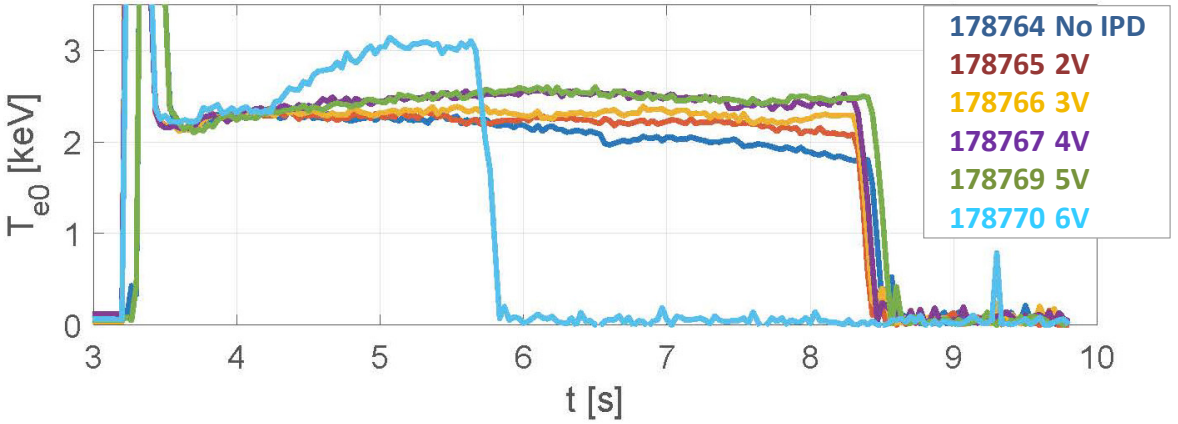
Larger granules expected to penetrate deeper into LHD plasmas than earlier powders.

Applicable impurity burden sensitive to heating type

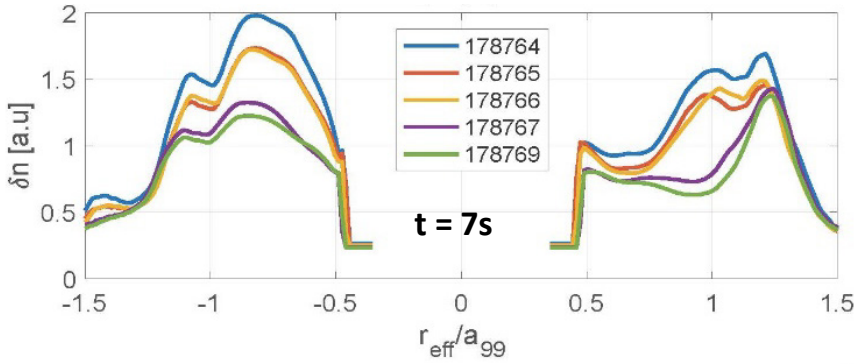
- IPDB_4C max with ECH = 2.5 V
- IPDB_4C max with ECH = 6 V

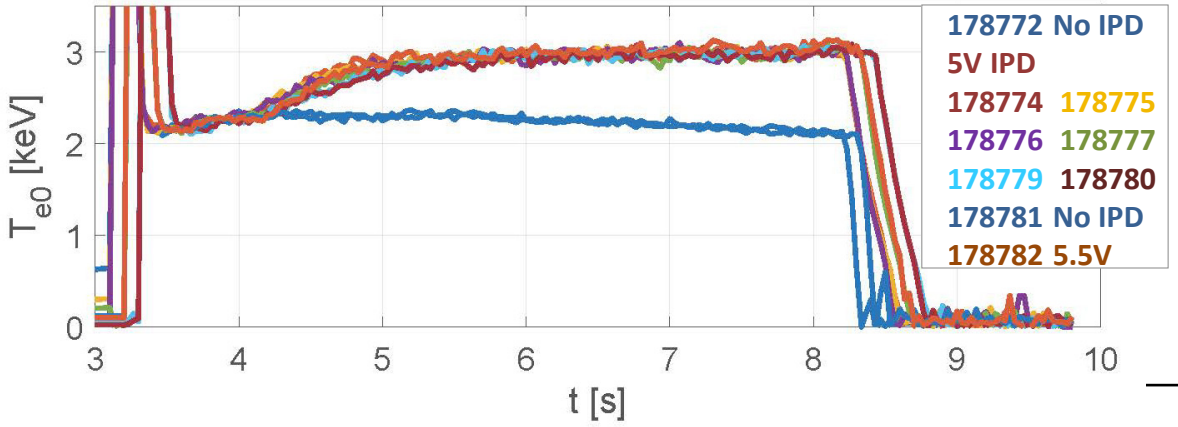
Injection level now substantial enough to improve discharge performance

- Scan of IPD Injection voltages shows increasing temperature improvement with higher injection levels
- Max injection rate for this heating level and this granule size determined
- Reduction in turbulent fluctuations appears to accompany increased performance
- Increase in temperature can be sustained throughout injection period
- Injected material modifies density profile, steepened at the edges, hollow in the middle. Possible mechanism for suppression of ITG type turbulence



PCI Turbulence Fluctuations





n_e, T_e evolution