

Impurity pellet injector

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1. Purpose / Application

- [1] Impurity transport study
- [2] Spectral identification
- [3] Improvement of ion temperature

2. Name of analysis (Kaiseki) data / module of MyView2

none

3. General Description (Port, field line, time resolution, spatial resolution, number of channels, etc.)

3.1. Impurity pellet injector

- Pellet size: 0.6-1.8 mm in diameter and height
- Pellet shape: cylinder, coaxial, sphere and hemisphere
- Pellet speed: ~ 200 m/s
- Pellet injection: 1 pellet/shot
- Pressure of He gas for pellet acceleration: 10-20 atm

3.2. Port assembly

- #10-O port (see Fig. 1)
- A pellet is injected at the equatorial plane with an angle of 12° from the normal to the toroidal magnetic field.

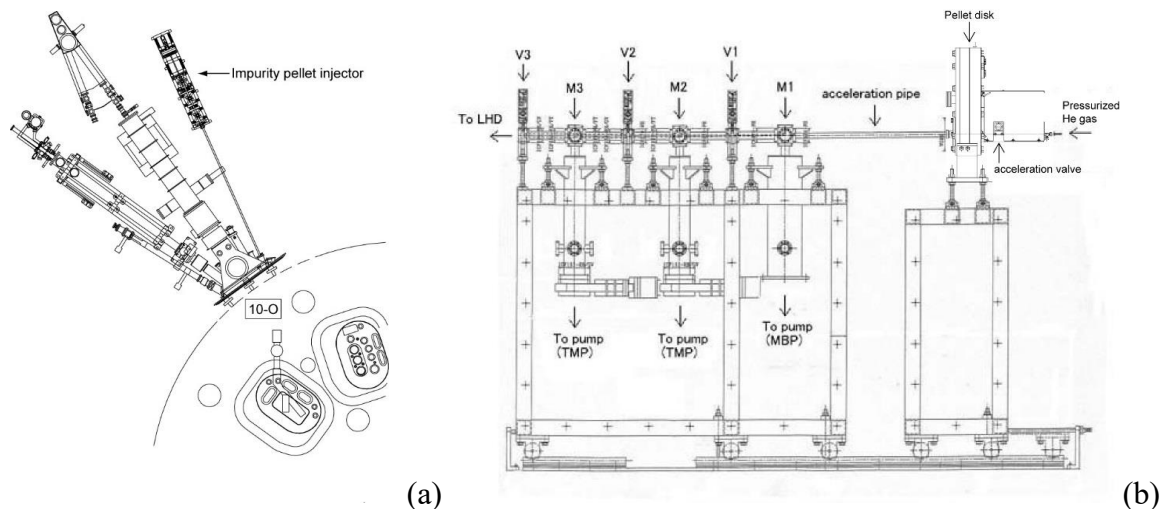


Figure 1 (a) Top View of the port arrangement. (b) Side view of the pellet injector.

4. Requirement in use

- Before experiment: loading pellets in the pellet disk, supplying pressurized He gas and turning on power supply of the controller.
- After experiment: Lowering He gas pressure and turning off power supply of the controller.

5. Description of analysis (Kaiseki) data / module of MyView2

none

6. Others

- Example of structure of coaxial pellets (see Fig. 2).

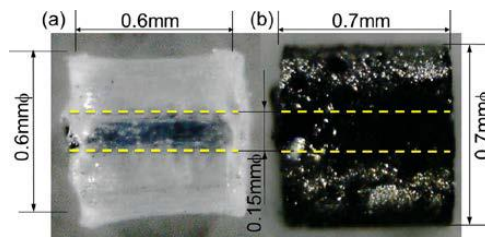


Figure 2 Photos of (a) W-in-polyethylene and (b) W-in-carbon coaxial pellets. The yellow dashed lines denote the position of tungsten wire.

- Example of ion temperature improvement by injection of a carbon pellet (see Fig. 3).

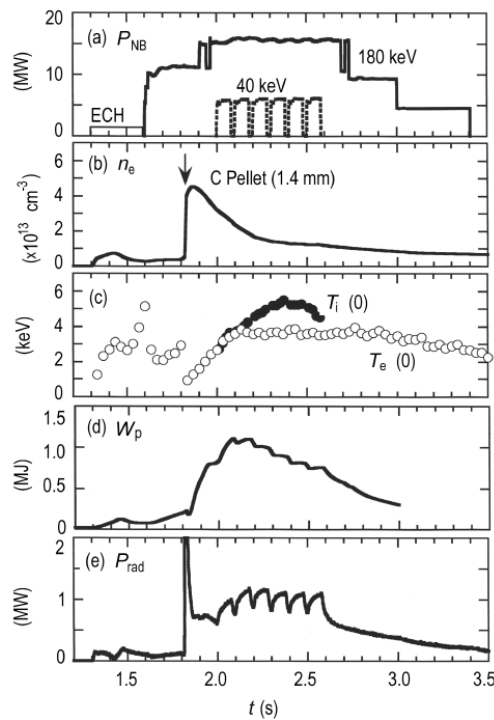


Figure 3 Discharge waveforms of (a) NBI power, (b) line-averaged electron density, (c) central electron and ion temperatures, (d) plasma stored energy and (e) total radiation power. Cylindrical carbon pellet with a size of $1.4\phi \text{ mm} \times 1.4\text{mm}$ is injected at $t=1.82 \text{ s}$ as indicated by arrow.

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- and others