Impurity monitor

T. Oishi, M. Goto, Y. Kawamoto
e-mail: oishi@nifs.ac.jp

1. Purpose / Application

[1] Monitoring impurity behaviors
[2] Signal supply to ECH power control system during long pulse discharges

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

imp01, imp02

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

3.1. 20cm normal incidence monochromators with SEM (see Fig. 1)
- Lyα, CIII, CIV, OV, OVI

Time resolution: Δt=0.1ms
Observation area: $1m^{V}x0.2m^{H}$

3.2. Grazing incidence monochromator with SEM
- FeXVI

Time resolution: Δt=0.1ms
Observation area: $0.2m^{V}x0.1m^{H}$

3.3. Interference filter + photomultipliers (or + APD)
- Hα, HeI (two systems for low- and high-density discharges)

Time resolution: Δt=0.1ms
Observation area: $1.2m^{V}x0.2m^{H}$

3.4. Others
- 20cm normal incidence spectrometers with CCD
- EUV spectrometers with CCD
- Radiation loss (SEM)

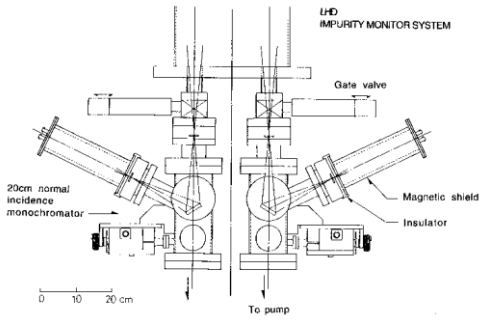

Figure 1 20cm VUV spectrometers for impurity monitor.

Port assembly: #10-O port (see Fig. 2)

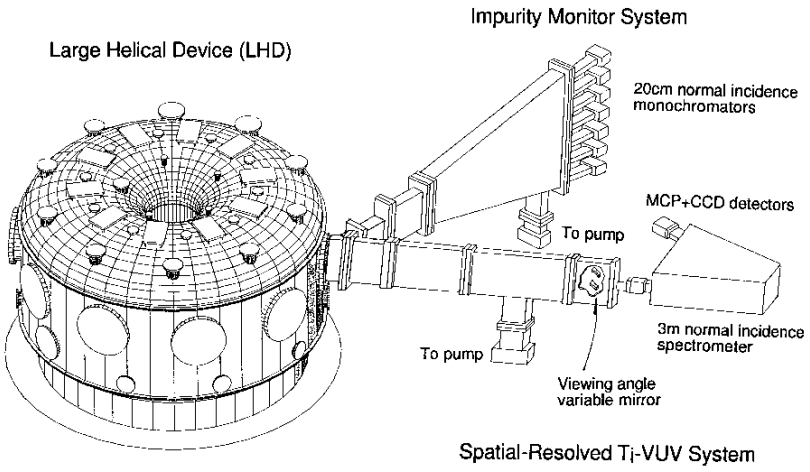

Figure 2 20cm VUV spectrometers for impurity monitor.

4. Requirement in use

- Before experiment: opening swing and gate valves, turning on power supply and setting CCD parameters

-After experiment: closing valves and turning off power supply

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

- imp01

DimNo = 1

DimName = 'Time'

DimSize = 12001

ValNo = 3

ValName = 'CIII','OV','none'

- imp02

DimNo = 1

DimName = 'Time'

DimSize = 1310

ValNo = 6

ValName = 'CIV', 'OVI', 'HI', 'FeXVI', 'CIII', 'OV'

6. Others

- Typical examples of CIII, OV and FeXVI from impurity monitor

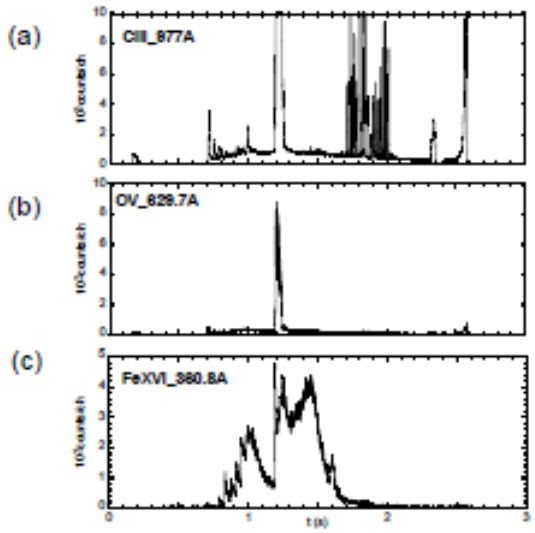

Figure 3 Typical examples of (a) CIII, (b) OV and (c) FeXVI from impurity monitor.

References

[1] S.Morita and M.Goto PST 8 (2006) 55.

[2] M.B.Chowdhuri, S.Morita et al., RSI 78 (2007) 023501.

[3] M.B.Chowdhuri, S.Morita et al., PFR 2 (2007) S1060.

[4] M.B.Chowdhuri, S.Morita et al., Appl.Optics 47 (2007) 135.

[5] M.B.Chowdhuri, S.Morita et al., PFR 3 (2008) S1043.

[6] M.B.Chowdhuri, S.Morita et al., RSI 79 (2007) 10F537.

[7] M.B.Chowdhuri, S.Morita et al., PoP 16 (2009) 062502.

[8] S.Morita, M.Goto et al., PST 11 (2009) 402.

[9] M.Kobayashi, Y.Feng, S.Morita et al., JNM 390 (2009) 325.

[10] S.Morita, M.Goto et al., FST 58 (2010) 91.

[11] M.Goto, S.Morita et al., FST 58 (2010) 394.

[12] S.Morita, C.F.Dong et al., PFR 5 (2010) S2004.

[13] M.B.Chowdhuri, S.Morita and M.Goto, RSI 84 (2013) 109901.

[14] T.Oishi, S.Morita, X.L.Huang, H.M.Zhang, M.Goto, PFR 10 (2015) 3402031.

[15] H.M.Zhang, S.Morita, T.Oishi, I.Murakami, X.L.Huang, M.Goto, PFR 11 (2016) 2402019.

[16] Y.Liu, S.Morita, T.Oishi, M.Goto, X.L.Huang, PFR 13 (2018) 3402020.

and others