

UTST球状トカマク実験における  
ドップラープローブを用いた局所的イオン流速の測定  
**Local Ion Flow Measurement using IDS probe  
in the UTST Spherical Tokamak Experiment**

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The University of Tokyo Spherical Tokamak (UTST) is a spherical tokamak device with the plasma start-up scheme using plasma merging method. Plasma merging induces ion bidirectional outflow caused by the magnetic reconnection which converts the magnetic energy into the plasma kinetic energy in a short period. To evaluate the flow generation and the resulting ion heating quantitatively, variety of ion Doppler spectroscopic measurements (IDS) are employed in the UTST<sup>[1]</sup>. In this paper, initial results from the local ion flow measurement by using an IDS probe<sup>[2][3]</sup> is presented.

Emission of CIII line(464.7nm) was observed by IDS probe whose line-of-sight is in the radial direction(Fig.1). Figure 2 shows the time evolution of CIII spectrum measured at R=460mm. Very broad spectrum observed during the plasma merging (0.7ms) is considered to be the combination of the bidirectional radial outflow. This wide broadening consists of gaussians of various velocity components up to 30 km/s .

An extended IDS probe with view dumps will be installed to measure the local ion flow vector around the reconnection X-point.

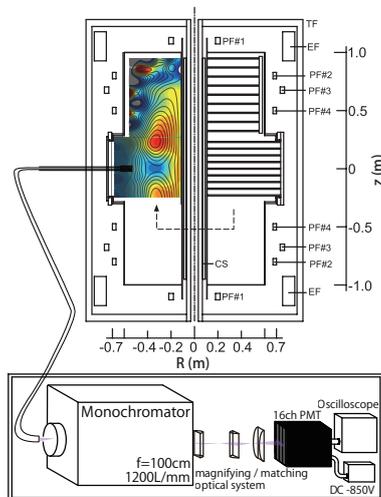


Fig.1 IDSprobe System

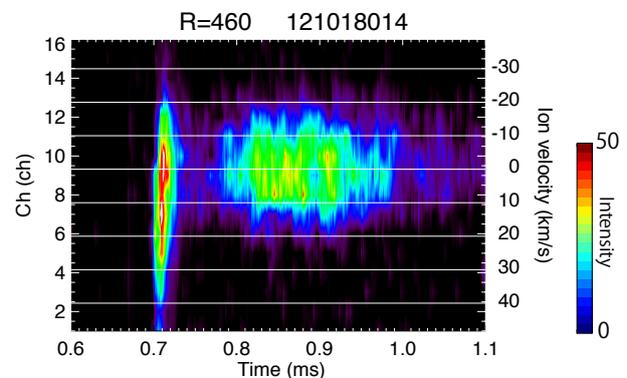


Fig.2 Time evolution of CIII spectrum

[1] Shuji Kamio et al. IEEJ Trans. FM, Vol.132, No.1 (2012).

[2] G.Fiksel,D.J.Den Hartog,and P.W.Fontana, Rev. Sci. Instrum. 69, 6 2024 (1998).

[3] A.Kuritsyn et al. Rev.Sci.Instrum. 77, 10F112 (2006).