

§1. LHD Plasma Measurement Using Fast Camera

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1. Introduction

This study is one of collaborative researches using Snet. The first author has been using a fast camera to study the peripheral plasma behavior in various magnetic field configurations (e.g. Heliotron J, GAMMA 10, CPD). Since last year the fast camera was managed by NIFS researchers, who would like to use it. Instead of this Hiroshima research group can use the fast camera data. It is very first time to try a new collaborative study.

2. Experimental set up

Last year the tens of GB data obtained by the fast camera were transferred and analyzed by Hiroshima research group. This year it is expected that more data were transferred and analyzed. However, the port for the fast camera had a small vacuum leak by an accident, and the installation of the fast camera was delayed. Therefore, the working time of the fast camera

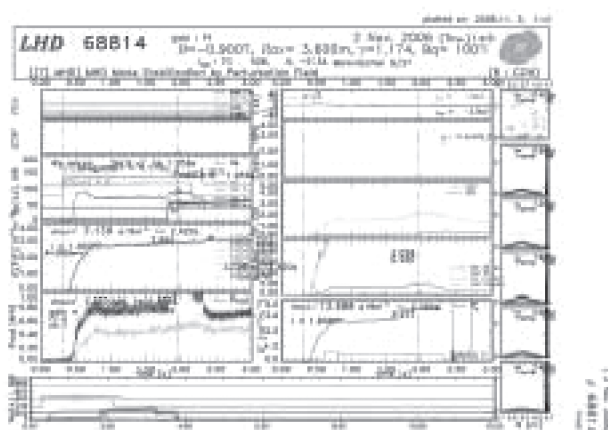


Fig.1 Typical plasma parameters of this study

was very few days. Fig.1-3 show successful dust measurement by the fast camera. Fig.1 shows typical plasma parameters for the dust measurement, and Fig.2 and 3 show the dust behavior in LHD plasma. Relative high density plasmas and low magnetic field of 0.9T were used for this study by Dr. Ashikawa, who has been studying the plasma-wall interaction to use the infrared camera. She found many dusts in low magnetic field LHD plasmas. Thus she would like to study the dust behavior to used the fast camera. Fig.2 and 3 are taken by 4500 FPS (frames per second). Fig.2. shows the dust ablation process, and Fig.3 shows the bending trajectory of the dust in LHD plasma. The divertor leg region is shown in the both figures, and the dusts move from the leg region. Unfortunately the dynamic range of this camera is only 8 bit, thus the signals from the divertor leg region are saturated. The dust speed of a few tens-hundreds m/s is suspected because of two-dimensional measurement.

3. Future plan

Dr. Ashikawa and other researchers would like to use the fast camera. We hope this new collaborative system will be successful.

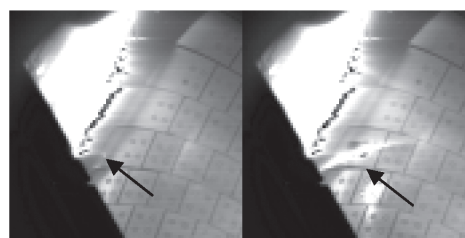


Fig. 2 Ablation of dust in LHD plasma

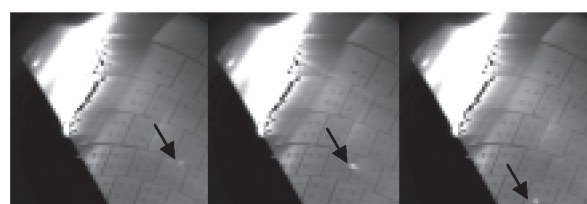


Fig.3 Trajectory of the dust in LHD plasma