

## §52. CPD Plasma Measurement Using a Fast Video Camera

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### 1. Introduction

CPD is an ST in Kyushu University and it has only four toroidal field coils. This allows us to make a plasma with wide ripple range. Therefore, CPD is suitable for plasma-wall interaction and/or peripheral plasma measurement.

### 2. Experimental Set up

The long length viewing port made by Hiroshima Univ. is installed in CPD horizontal section to measure the half of the vacuum vessel. Fig.1 shows the schematic of the measurement system.

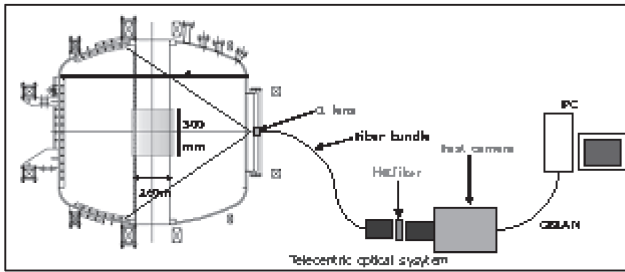


Fig. 1 Port location in CPD and fast camera system

### 3. Results and Discussion

Fig.2 shows the typical waveform of current drive by 8.2GHz EBW experiment. Plasma current starts up  $\sim 0.2$ s and it grows rapidly  $\sim 0.22\sim 0.23$ s. After grown up period plasma current increase gradually and it reaches its maximum point. Then MHD event turns out the plasma. The interesting point is that initial plasma current generation period and plasma current grown up period. Unfortunately initial phase is very dark therefore there are no images in fast camera. However, during the current grown up period plasma shape is recognized in the images. Fig. 3 shows the fast camera images in the current grown up period indicated by red and green dashed line in Fig.2. Plasma shape is similar with the calculated results shown in Fig.3.

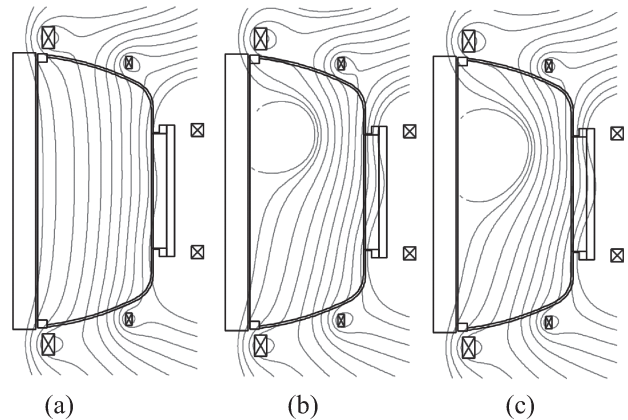
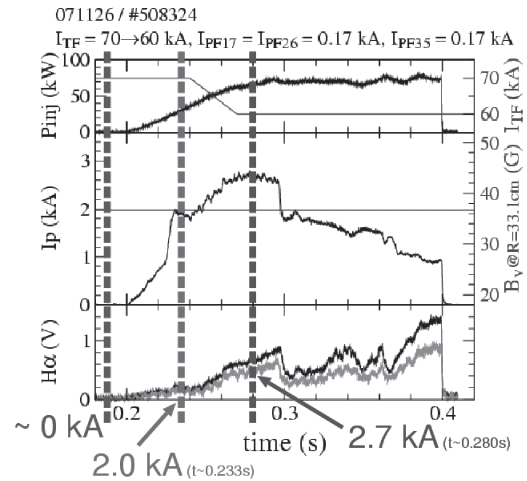
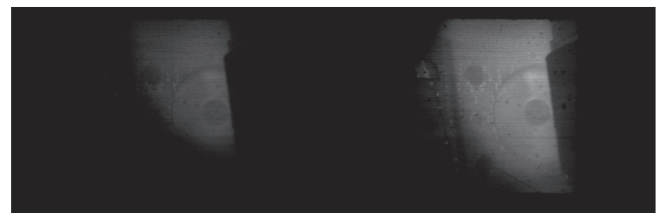


Fig. 2 Typical waveform of EBW current start up (up) and magnetic surface construction results indicated the dashed lines (a) magnetic surface at time indicated the cyan dashed line, (b) green, and (c) red



(a) (b)

Fig. 3 Fast camera images (a)  $t=0.232$ s (green dashed line in Fig.2), (b)  $t=0.280$ s (red dashed line in Fig.2)

### 4. Summary

The fast camera allows us to control CPD plasma easily, and it gave valuable plasma images. CPD will be shut down, and project "QUEST" will begin this year, therefore, the peripheral turbulence measurement will be held using QUEST plasma.