

#### §4. Neutral Pressure Measurements in the CHS LID

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An ASDEX-style fast (1-ms response time) ion gauge (FIG) mounted in the LID chamber on CHS has been used to study the LID pumping effective-ness for a variety of conditions. In these experiments, the current ( $I_{LID}$ ) in 8 pairs of coils above and below CHS was set to create either an O-point or an X-point of an  $m/n = 1/1$  island at the location of the LID head. Figure 1 shows the time history of the gas puff, the averaged density ( $n_e$ ), the neutral beam pulse (NB) and the FIG signal with  $R_{axis} = 99.5$  cm and  $B_0 = 0.92$  T.

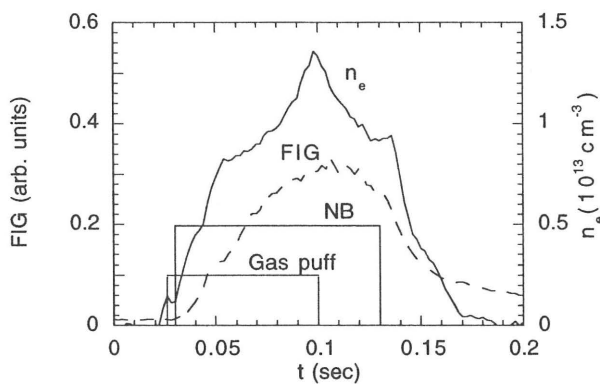


Fig. 1. Time history for a typical LID shot

Figure 2 (top) shows the variation of the FIG signal at 80 ms as  $I_{LID}$  is varied from 0 (no island) to 1.1 kA for a fixed gas puff. The symbols "O" and "X" indicate O-point and X-point operation, respectively. The largest difference between O-point and X-point operation occurs for  $I_{LID} \approx 0.6$  kA. The plasma density also changes as the island size is varied (Fig. 2, middle), but the O-point and X-point  $nl$  values are the same for  $I_{LID} \leq 0.4$  kA and  $\geq 1$  kA although the FIG values are quite different. The FIG pressure normalized to  $nl$  is shown in Fig. 2 (bottom). The O-point ratio has a broad peak as  $I_{LID}$  is varied, but the X-point ratio is independent of  $I_{LID}$ .

Similar behavior is seen at other radial locations for the LID head. The FIG signal increases

as the LID head is moved closer to the plasma and generally varies in the same way as the ion saturation current measured with a Langmuir probe in the LID chamber [1].

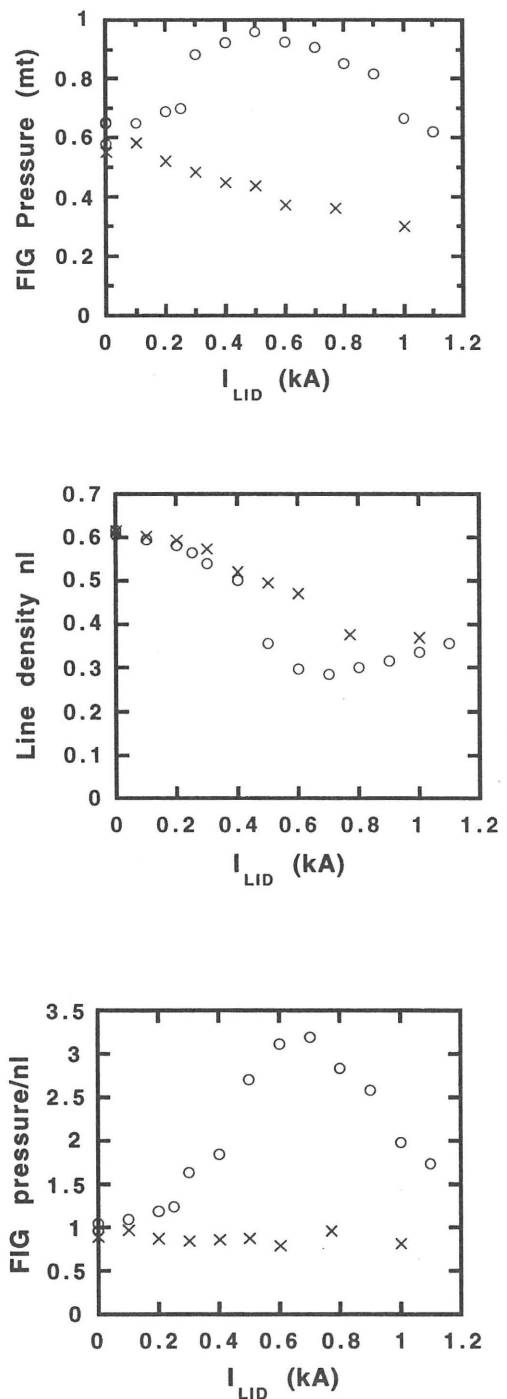


Fig. 2. Variation of FIG pressure (top),  $nl$  (middle) and the ratio (bottom) as  $I_{LID}$  is varied.

#### Reference

- 1) Komori, A., *et al.*, in *12th Int. Conf. on PSI 1996*, St. Raphael, p.161.