

Peterson, B.J., Sudo, S.

This report details research activity during the 1997 fiscal year including bolometer measurements on the Compact Helical System (CHS) at the National Institute for Fusion Science (NIFS).

An 8 channel bolometer array using metal film detectors manufactured by PTS (Germany) was installed in CHS (Fig. 1) and used to investigate the effects of wall reflections and the effects of gas puff duration and neutral beam injection angle on the radiation profiles in CHS[1]. Using two

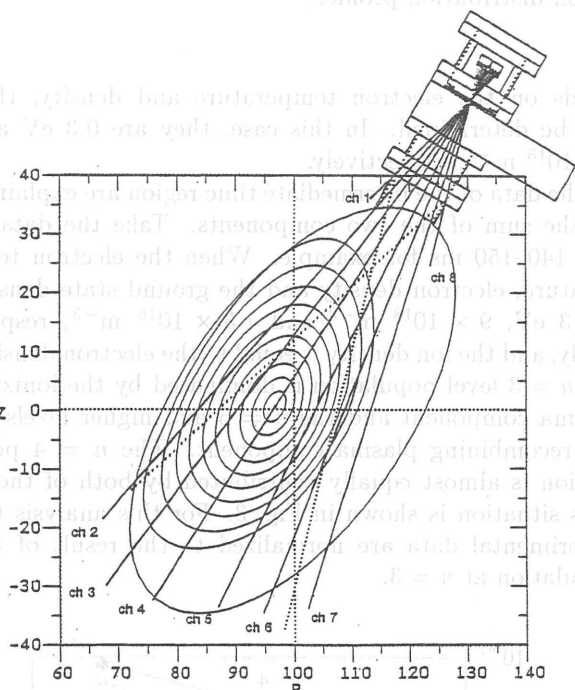


Fig. 1 Bolometer camera, with viewing chords and magnetic surfaces. The average β is 0.2%.

of the channels which were viewing the walls of the vacuum chamber it was observed that wall reflections contribute less than 6% of the bolometer signal. Gas puffing experiments during NBI sustained plasmas showed that the radiation from the plasma edge decreased after the puff was turned off (Fig. 2). This is attributed to a simultaneous decrease in the plasma density at the edge as observed from the interferometer data. In another set of experiments, as the NBI beam

angle was changed from an inboard radius of tangency to an outboard radius of tangency, the time it took for the hollow radiation profile to fill in after the gas puff was turned off increased (Fig. 3). The absence of such a change in the interferometer data indicates that this phenomena is not related to a change in the edge density.

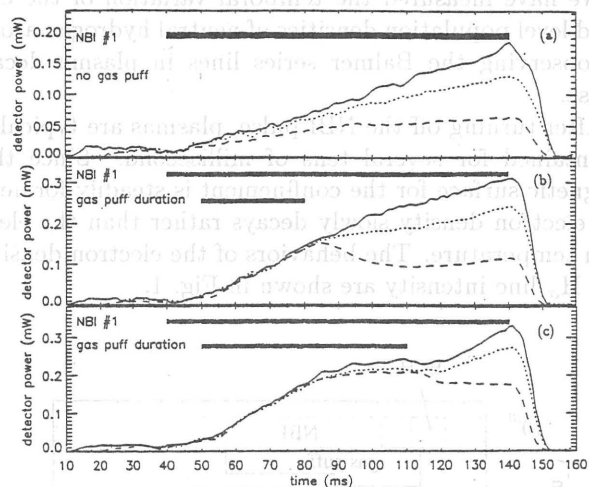


Fig. 2 Bolometer power versus time for Channels 4-6 (top to bottom) with varying gas puff durations.

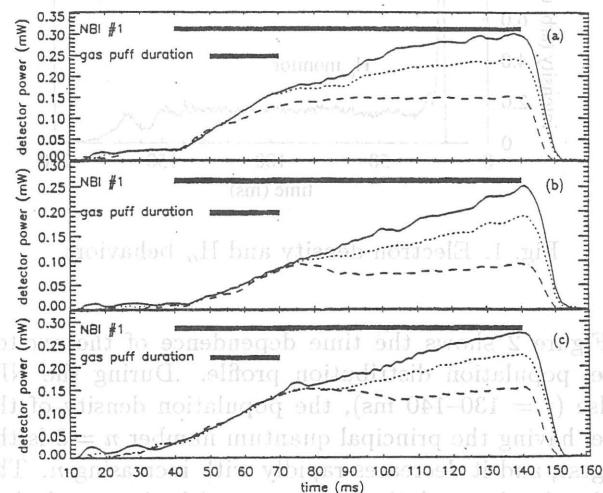


Fig. 3 Bolometer power versus time for Channels 4-6 (top to bottom) with R_t of (a) 80 cm, (b) 87 cm and (c) 94 cm.

Reference

[1]B. J. Peterson, et al., "Bolometer studies in CHS", Journal of Plasma and Fusion Research Series, 1, 382-385 (1998).