

## §1. ECH Experiment with 106GHz Gyrotron

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The new gyrotron with the 450kW output at the frequency of 106GHz was installed in CHS hall last year[1]. The output power from this gyrotron is introduced to the quasi-optical transmission system which had been used for 53GHz two gyrotron [2]. Figure 1 shows the mirror transmission system installed on CHS. Switching mirrors are added to select the two beams out of three gyrotrons on the experimental purpose. The same highly focusing antenna system which was originally designed for 53GHz is used. As a result, the beam spot size on the mid-plane of the CHS vacuum vessel should be about 10 mm in radial and 35 mm in toroidal directions for 106GHz.

One of the motivations of introducing the 106GHz high power gyrotron is to keep high electron temperature at high density, since the

cutoff density for the second harmonic X mode is  $7.2 \times 10^{19} \text{ m}^{-3}$ . Figure 2 shows the electron temperature and density profiles during the rather high density operation. The electron temperature at the center is kept over 1 keV even at the averaged electron density of  $3.5 \times 10^{19} \text{ m}^{-3}$ .

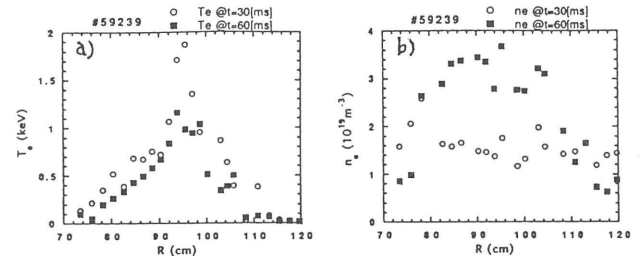


Fig. 2 Electron temperature a) and density b) profiles during the high density ECH experiment.

### References

- [1] Kubo, S. et al., Ann. Rep. NIFS (1995.4-1996.3) 222.
- [2] Kubo, S. et al., Fusion Eng. and Design 26 (1995) 319.

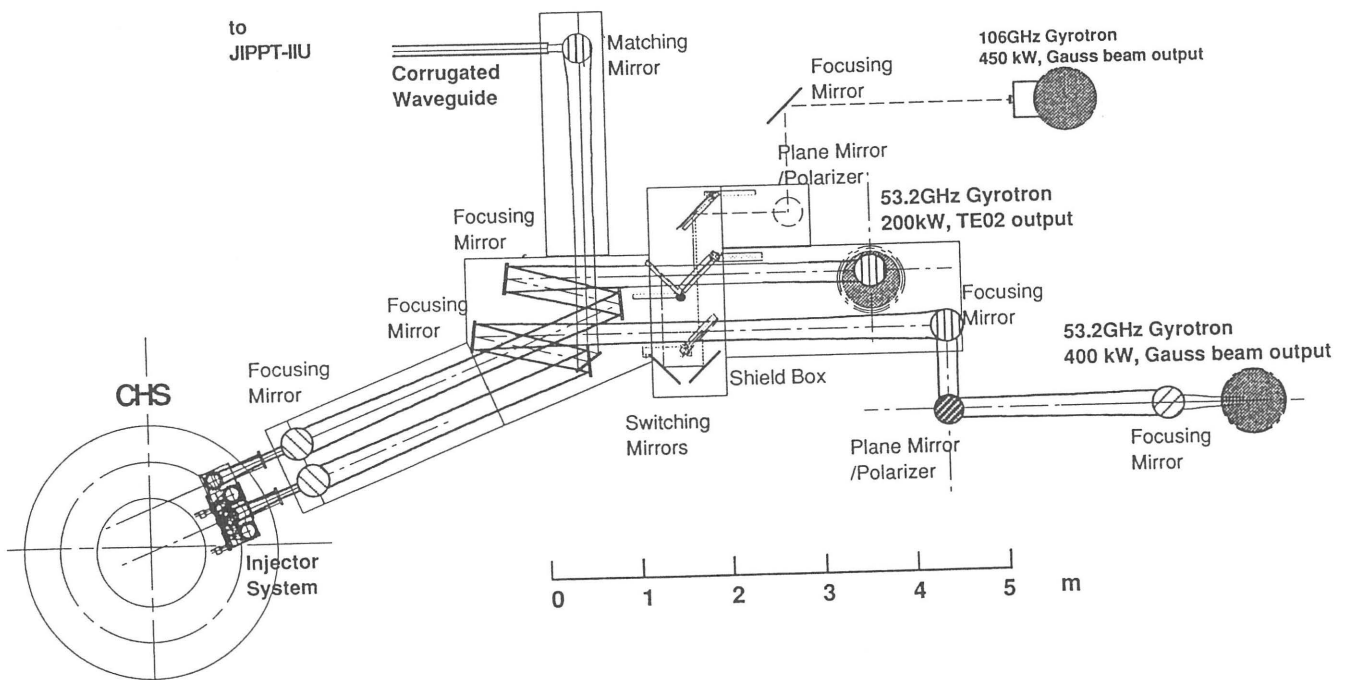


Fig. 1 Microwave transmission system for two 53GHz and one 106GHz gyrotrons on CHS.