

§15. YAG Thomson Scattering System and VUV Monochromator for TPD-II

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For quantitative study of the contact phenomena of a plasma with a neutral gas, YAG Thomson scattering system and VUV monochromator have been installed in the TPD-II device (see Fig. 1). Q-switching YAG laser (10 Hz rep. rate, 80 mJ/s, pulse width 12 ns) and polychromator for analyzing the scattered light ($f = 250$ mm, $F = 4.3$) equipped with 1024 channel photo-diode array have been fabricated. In order to use a detection system in visible wavelength region, 2nd harmonics of 532 nm light is injected into the plasma. Because of a small output power of the laser, typically 1000 laser shots

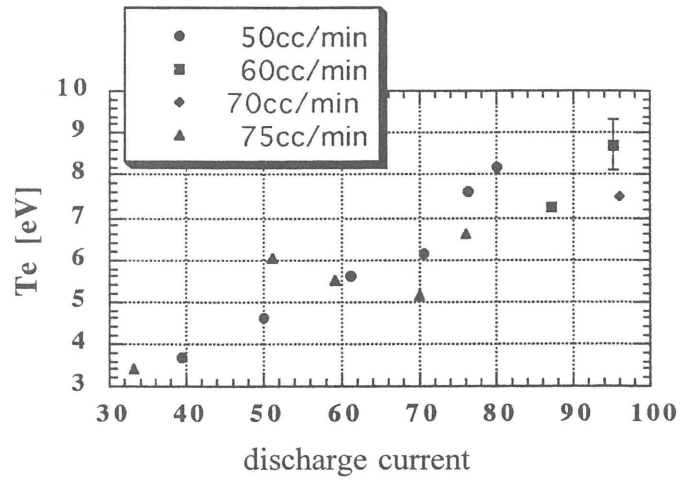


Fig. 2. Dependence of electron temperature on discharge current as a function of He gas flow rate into a discharge region.

are necessary to get a good S/N ratio. Figure 2 shows the measured electron temperature in helium plasma at TPD-II.

In addition to the Thomson scattering system, calibrated VUV monochromator was used for the electron temperature measurement. The electron temperature deduced from the intensity ratio of CIV 2p - 2s, and 3p - 2s agrees fairly well with the results of Thomson scattering.

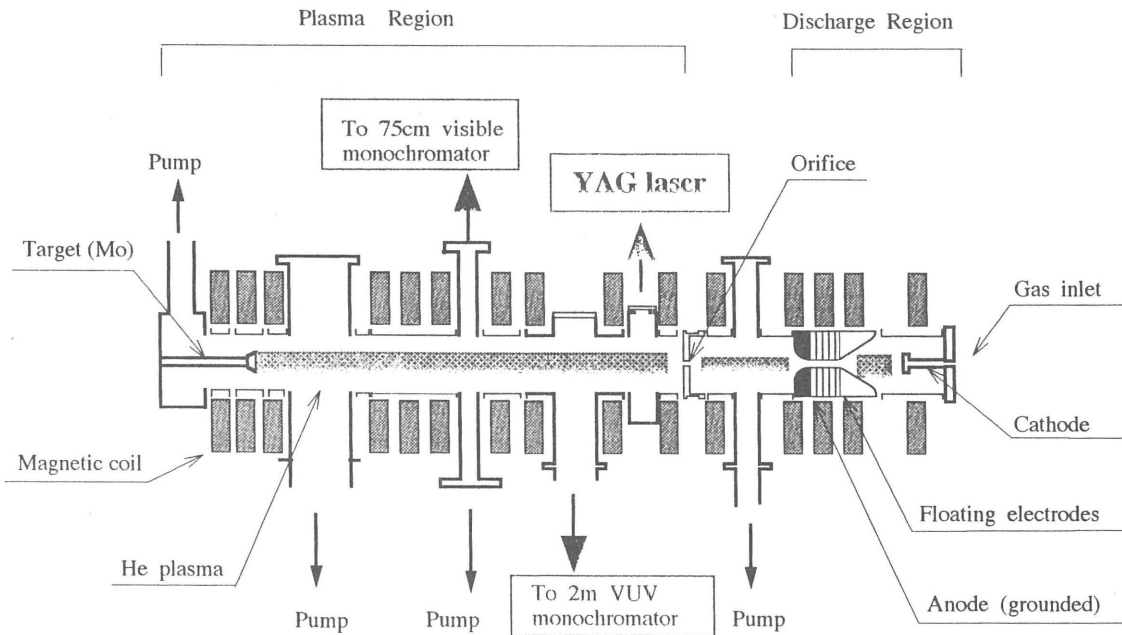


Fig. 1. Schematic of TPD-II device.