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GAMMA10/PDXにおけるダイバータ模擬プラズマへの希ガス導入時の静電プローブ計測

Langmuir probe measurements of divertor simulation plasma injected noble gas on GAMMA 10/PDX

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The divertor simulation experimental module (D-module) was installed in the west-end region of GAMMA 10/PDX. In the D-module, the V-shaped tungsten target was equipped. We have measured plasma paramaters in front of the V-shaped target with Langmuir probes under the condition of noble gas injection. Figure 1 shows a schematic view of the V-shaped target. L is the length from the corner of the target along the target surface. Nozzles for gas injection were set on the upper and lower plate. H_2 gas was injected from the nozzle on the upper plate and the noble gas (Ne or Ar) was injected from the lower plates. Langmuir probes are installed on the upper target plate as shown in Fig 1.

Figure 2(a) shows electron temperature distribution on the plate. Electron temperature decreased toward the corner in the case of H_2 gas injection. In the case of injection of the H_2 and noble gases electron temperature distribution was almost flat. Figure 2(b) shows electron density distribution. Electron density distribution was almost flat in the case of H_2 gas injection. In the case of injection of the H_2 and noble gases, electron density at L= -175mm was increased. Figure 2(c) shows electron pressure distribution. The electron pressure decreases toward the corner in the case of H_2 gas injection. In the case of injection of the H_2 and noble gases, electron pressure has a peak at L= -175mm. The electron pressure seems to be increased due to energy transfer from ions.

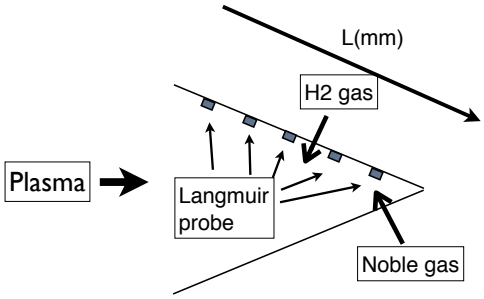

Fig 1: A schematic view of the V-shaped target

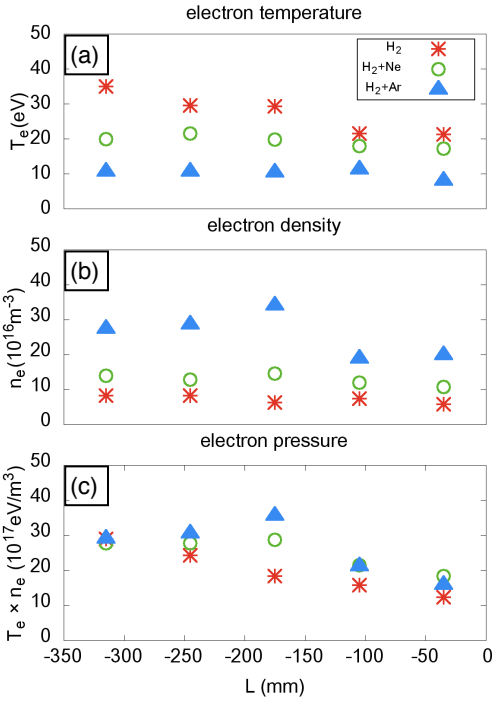

Fig 2: Spatial distribution of (a) electron temperature (b) electron density (c) electron pressure in the cases of injection of H_2 gas only and both H_2 and noble gases.