

Characteristics of Hot Spot Radiation in the Divergent Gas-Puff Z Pinch

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The divergent gas-puff z pinch has been devised for the realization of an efficient soft x-ray point source with repetitive operation. In the early experiment, hard x-ray which has not been observed in the usual z pinch were observed, and the generation of high energy electron became clear [1]. Also, high energy ions of MeV order were observed, and the existence of ion acceleration independent of the current direction was confirmed [2]. In the divergent gas-puff z pinch, the plasma converges to the front of center electrode, and a hot spot is formed.

The Nihon University SHOTGUN III device has a 40 kV, 12 μ F capacitor bank which is capable of charging both positive and negative. The peak current at the charging voltage of 25 kV is about 180 kA. Argon gas was used for the operating gas, and the plenum pressure was 5 atm. Two CCD cameras were used for the observation of K-shell and L-shell radiations of argon ions emitted from the hot spot. The CCD with a beryllium filter captures only K-shell radiation, and the CCD with an aluminum coated Mylar captures both K-shell and L-shell radiations. It was confirmed that the diameter of K-shell radiating spot was about 60 μ m, and L-shell radiation structure of about several mm spread around it. The K-shell radiation was applied to the observation of living tissue.

References

[1] K. Takasugi and E. Kiuchi, Plasma Fusion Res. **2**, 036 (2007).

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