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Measurement of supersonic plasma interacting with stationary plasma by electric probes DONG HAN LEE, IN JE KANG, MIN KEUN BAE, SOON-GOOK CHO, SANG-YOU KIM, HEUNG-GYOON CHOI, SUNG-HOON HONG, Hanyang Univ, TAE-HYUP LHO, National Fusion Research Institute, KYU-SUN CHUNG, Hanyang Univ — Supersonic plasma is generally related to the formation of young star object (YSO), active galactic nuclei (AGN) and new galaxies via plasma bubble expansion during the event of super nova. Capacitive coupled plasma (CCP) is produced by RF power of 13.56 MHz and the plasma is accelerated by negatively biased cascade grid to produce supersonic flow. Electron temperature, plasma density and Mach number are measured by using a single probe and a Mach probe. Electron temperature and plasma density of CCP are 0.8 eV and 1.8×10^9 cm^{-3}, respectively. Mach number of supersonic plasma flow is about 2 and 50 W RF power at 52 mTorr. Ambient plasma is generated by DC filament discharge and its electron temperature and plasma density are 0.5 eV and 3×10^{10} cm^{-3}, respectively. When the supersonic plasma flow interact with ambient plasma, electron temperature is increased higher than ambient plasma up to 4 eV, and plasma density is decreased from 4×10^{10} cm^{-3} to 1×10^{10} cm^{-3}. Density contrast η of supersonic plasma flow of our experiment is about 0.04, while AGN jets in universe are observed to have density contrast η of lower than 10^{-2}.

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