

MEASUREMENT OF STREAM INSTABILITY OF ARGON-XENON PLASMA

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Previous experiments had shown the existence of ion-ion beam instability in weakly collisional Argon-Helium plasma in the pre-sheath near a negatively biased plate. [1] A new theory [2] suggests that this instability enhances the collisional friction between the ion species and determines their velocities at the sheath-presheath boundary. Here we report experimental measurements of the ion-ion instability in Argon-Xenon plasma carried out in conjunction with LIF velocity measurements. Instability is measured by a cylindrical probe collecting electron saturation current. Ion Acoustic Wave phase velocity measurement is employed to determine the relative ion concentrations. Electron temperature is measured by a Langmuir probe and the sheath locations are determined by an emissive probe [3].

[1] Hershkowitz N, Ko E, Wang X, Hala AMA. IEEE Trans. Plasma Sci. 33, p631-636 (2005)

[2] S.D. Baalrud, J.D. Callen, and C.C. Hegna. Phy. Rev. Lett. 103. 205002 (2009)

[3] Hershkowitz N, Wang X, Rev. Sci. Instrum. 77, 043507 (2006)

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