Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

**Observation of Ion-neutral Collision Effect on Two-Ion-Stream Instability near Sheath-Presheath Boundary** NAM-KYUN KIM, J. SONG, H.-J. ROH, Y. JANG, S. RYU, G.-H. KIM, Seoul National University, Seoul, Korea — The ion velocity normal to the sheath-presheath boundary in weakly-collisional Ar/Xe mixture plasmas was measured by using LIF measurement. This investigation would give an answer to the old debate topic in the sheath community, whether each ion enters the sheath with their *own Bohm velocity*, $C_{\mathrm{B}} = (T_{\mathrm{e}}/M_{\mathrm{i}})^{1/2}$. In collisionless two-ion-species plasmas, Barrud and Hershkowitz concluded that the two-stream instability limits their velocities to become *the common system sound speed*, $C_{\mathrm{s}} = (n_1 T_{\mathrm{e}}/n_{\mathrm{e}} M_1 + n_2 T_{\mathrm{e}}/n_{\mathrm{e}} M_2)^{1/2}$. This instability is activated when the relative velocity becomes a critical velocity. In practices, the collisionless condition is not achievable. In this study, the ion-neutral collision effect on the instability was investigated with increasing the pressure of the Ar/Xe mixture gas in the range of 0.5 - 2 mTorr. Plasma is generated in a DC multi-dipole source in which $n(Ar^+)/n(Xe^+)$ is controlled to be 1. Results show that the instability is grown at $p$ <2 mTorr and the ion drift velocities at the sheath edge are close to $C_{\mathrm{s}}$. At 2 mTorr, the ions reach their individual $C_{\mathrm{B}}$ at the sheath edge because the instability is not grown, observing that the characteristic length of the instability is a function of the ion-neutral collisions. The details will be discussed in the conference.

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Date submitted: 13 Jun 2016 Electronic form version 1.4