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Axially-propagating millimetric electron density fluctuations in the Hall thruster plasma SEDINA TSIKATA, CYRILLE HONORE, LPP - Ecole Polytechnique, NICOLAS LEMOINE, IJL - Universite Henri Poincare, DOMINIQUE GRESILLON, LPP - Ecole Polytechnique — The application of the collective light scattering diagnostic to the study of electron density fluctuations has so far provided information on unstable mode characteristics in the Hall thruster plasma. An azimuthally-propagating mode, believed to contribute to anomalous electron transport, has been observed experimentally at the thruster exit [1], confirming some key theoretical predictions as to its frequency and length scale [2], and revealing new mode features such as directivity of propagation, angular extent, dispersion relation and amplitude. This work focuses on the second key mode observed experimentally, which propagates axially in the thruster plume. Its characteristics (group velocity, directivity and angular extent) appear to be strongly linked to those of the axially-directed ions. It may serve as a new means of remotely measuring large-scale features of the ion plume, such as its divergence. Experimental and theoretical aspects concerning this mode are discussed.

[1] Tsikata et. al., Phys. Plasmas, vol. 16, p. 033506 (2009)
[2] Adam et. al., Phys. Plasmas, vol. 11, p. 295 (2004)

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