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Spatiotemporal characteristics of plasma structure induced by manipulation of electron cross-field transport in a Hall thruster[1] JUNHWI BAK[2], REI KAWASHIMA, KIMIYA KOMURASAKI, The University of Tokyo — In ExB plasmas such as Hall thrusters and magnetrons, azimuthally propagating coherent structures, such as the rotating spokes, are commonly found. Because plasmas are typically generated from initially uniformly applied operating parameters and resulting from interactions between multiple species, it is often difficult to distinguish which species is responsible for a specific observed result. In this work, we artificially introduce azimuthal inhomogeneity in neutral particles and magnetic fields that strongly affect the magnetized electrons. By doing so, it can help to understand how manipulated parameters are related to observed plasma structures. With a high-speed camera, we investigate spatiotemporal characteristics of plasmas structure resulting from the altered electron flows and the relation between electron cross-field transport and self-formed plasma structure. In certain conditions, we observe a rotating spoke that clearly distinguishes itself from the ionization wave as it continues to rotate, leaving the localized enhanced ionization region behind.

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