The rotating spoke is a low-frequency azimuthal wave, which has been observed in a variety of cross-field discharges, including linear magnetized plasma devices and Hall thrusters. The spoke can appear in different modes which propagate in the direction perpendicular to electric and magnetic fields with velocities of much lower than $E\times B$ velocity$^{1,2}$. Despite decades of investigation, the origin, dynamics and nature of the spoke are still poorly understood. In recent studies of cylindrical and annular Hall thrusters with segmented anodes, it was demonstrated that the spoke is directly responsible for the enhancement of the electron cross-field transport$^{3,4}$. A combination of time-resolving plasma measurements with a variety of plasma diagnostic tools suggests that the spoke instability is triggered by the ionization mechanism. This result is supported by recent particle-in-cell simulations$^5$. The advancement in understanding of the spoke mechanism enabled us to develop and demonstrate effective methods of spoke control and spoke suppression. Practical implications of these results open the path to the development of more efficient magnetized plasma thrusters.
