Abstract Submitted
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Viscous dissipation and radiative transport in magnetic reconnection of collisionless magnetized plasma[1] GUNSU YUN, Pohang University of Science and Technology, JEONG-YOUNG JI, Utah State University, Logan, SHEKAR THATIPAMULA, Pohang University of Science and Technology, KSTAR TEAM — Viscous dissipation rate of magnetic field energy due to wave-like fluctuations in collisionless magnetized plasma is obtained analytically using the exact integral closure for electron fluid viscosity [Ji, Phys. Plasmas 21 (2014)]. For typical high-temperature tokamak plasma, the viscous resistivity is several orders larger than the Spitzer (collisional) resistivity. For magnetic reconnection, it is also found that the radiative transport (i.e. Poynting flux) of the field energy of Alfven waves [Bellan, Phys. Plasmas 5, 3081 (1998)] is comparable to the viscous dissipation. The viscous dissipation is more effective for shorter wavelength fluctuation. The importance of viscous dissipation is supported by broadband emission and chirping-down phenomena observed in the ion cyclotron harmonic frequency range at the crash onset of edge-localized mode on the KSTAR tokamak.

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