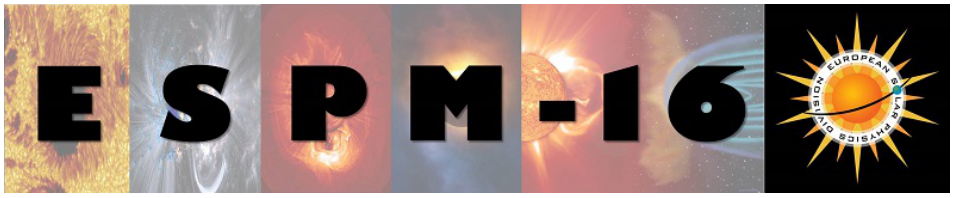

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Effects of a Velocity Shear on Explosive Phases of Double Tearing Modes

Wednesday, 8 September 2021 17:22 (13 minutes)

The presence of multiple current sheets in reconnection environments is expected due to the inherent turbulence associated with it. A velocity shear in reconnection environments is also common due to the dynamic nature of the process. We have investigated the effect of a sub and super-Alfvenic velocity shear on the explosive phase of an "*ideal*" double tearing mode (DTM) within the 2D resistive magnetohydrodynamic framework. The system exhibits an explosive reconnection phase which is a combined result of the plasmoid instability and an island structure driven instability where the cascading effect of the magnetic islands tend to increase the reconnection rate by pushing magnetic flux towards the x-points. We find that the theoretical scaling of the reconnection rate in the presence of a velocity shear flow is strongly dependent on the island half-widths and larger sized islands tend to enhance the reconnection rate drastically. These types of scaling in explosive systems evolving on an "*ideal timescale*"are relevant from the perspective of magnetic reconnection in very high Lundquist number systems such as those realized in the solar corona.

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