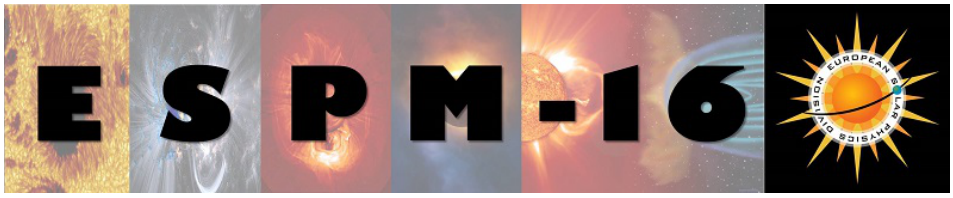

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A Statistical Study of Plasmoids associated with post-CME Current Sheet

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We investigate the properties of plasmoids observed in the current sheet formed after an X-8.3 flare on September 10, 2017, using Extreme Ultraviolet (EUV) and white-light coronagraph images. The main aim is to understand the evolution of plasmoids at different Spatio-temporal scales using existing ground- and space-based instruments. We identified plasmoids in the current sheet observed in successive images of AIA and white-light coronagraphs, K-Cor, and LASCO/C2. We found that the current sheet is accompanied by several plasmoids moving upwards and downwards. Our analysis showed that downward and upward moving plasmoids have an average width of 5.92 Mm and 5.65 Mm, respectively in the AIA field of view (FOV). However, upward-moving plasmoids have an average width of 64 Mm in K-Cor which evolves to a mean width of 510 Mm in the LASCO/C2 FOV. Upon tracking plasmoids in successive images, we observe that downward and upward moving plasmoids have average speeds of ~272 km/s and ~191 km/s respectively in the EUV passbands. We note that the plasmoids become super-Alfvénic when they reach LASCO FOV. Furthermore, we estimate that the null-point of the current sheet at ~1.15 Rsun where bidirectional plasmoid motion is observed. We study the width distribution of plasmoids formed and notice that it is governed by a single power-law with an index of -1.12. Unlike previous studies, there is no difference in trend for small and large-scale plasmoids. The presence of accelerating plasmoids near the neutral point indicates a longer diffusion region as predicted by MHD models.

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