MMS Observations of Short-Period Current Sheet Flapping

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Flapping motions of current sheets are commonly observed in the magnetotail. Various wave modes can correspond to these oscillations such as kink-like flapping or steady flapping (e.g. Wei2019). The period of such oscillating phenomena is usually longer than 100s and a typical observations consist only of a few crossings (e.g. Zhang2002). Here, we present a short period (T=25s) flapping event observed by Magnetospheric Multiscale (MMS) mission at the dusk side plasmasheet on September 14, 2019. Using the multispacecraft observations, the direction of flapping as well as the direction of propagation of the current sheet are determined using the minimum variance, the timing method and the spatiotemporal derivative (Shi2005). It appears that the three methods give similar results with a direction of propagation of the current sheet which mainly lies in the ecliptic plane with a flapping velocity up to 500km/s. Based on the obtained wavelength and the variations of the direction of propagation we discuss which of the wave modes can explain the flapping.