Unsteady energy dissipation in the magnetic reconnection diffusion region

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Magnetic reconnection is a universal physical process during which energy can be transferred from the electromagnetic field to the plasma. Energy dissipation in the diffusion region has always been a significant issue for understanding this energy transport. Using the four MMS spacecraft data, we investigate a magnetic reconnection diffusion region event at the magnetopause. Similar magnetic field and electric current behavior between each spacecraft indicates the formation of a quasi 2D structure. However, we find that the energy dissipation results of each spacecraft are different. Further analysis indicates that the reconnection electric field, $E_M$, plays a key role in this process. Thus, we suggest that the energy dissipation of magnetic reconnection is unsteady on this spatial or temporal scale, even under stable diffusion conditions.