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Multi-Spacecraft Observations of Magnetic Reconnection in ICME sheaths

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Magnetic reconnection is a phenomenon where the energy stored in the magnetic field dissipates into heating and particle acceleration. It can occur on boundaries connecting plasma with different magnetic field topologies. We can frequently found magnetic reconnection in ICME sheaths, where plasma is compressed and different plasma topologies encounter each other, or at the boundaries of ICME sheaths and magnetic clouds, where the strongest reconnection with the largest shear angle can be found.

We present a study based on data from the WIND, CLUSTER, and THEMIS spacecraft during a period of 2001-2011. Through this period, we track the signatures of magnetic reconnection inside ICME sheaths such as a rotation of the magnetic field or acceleration and heating of plasma. We found magnetic reconnection which is observed on multiple spacecraft and we analyze their distribution through space and variations of their properties.