Flux Transfer Events are Made in Pairs

Christopher Russell and Robert Strangeway
University of California, Los Angeles, Earth Planetary and Space Sciences, Los Angeles, United States of America
 ctrussell@igpp.ucla.edu

Flux transfer events are transient magnetized plasma structures that are self-balancing, rope-like phenomena that appear when the interplanetary magnetic field is southward. Using measurements of particles and magnetic fields on the MMS spacecraft, we find that these structures contain magnetospheric energetic electrons in exactly half of their observations, independent of external conditions or locations. This implies that two flux ropes are created for each event, one connected to the magnetosphere and one not connected. We show that this dual nature occurs independent of solar wind properties and location of observation. These observations are consistent with a recent model of flux transfer event generation.