

Spontaneous reconnection in a laboratory experiment.

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A new experimental configuration has been developed for study of collisionless reconnection in the Versatile Toroidal Facility (VTF) at MIT. A parameter regime of special interest exists where the reconnection process appears in rapid bursts. This provides a unique opportunity to study the “trigger problem” of reconnection in current sheets confronting the unresolved issues related to the spontaneous and explosive onset of events observed both on the sun and in the Earth magnetotail. Our measurements include the detailed time evolution of the plasma density, current density, the magnetic flux function, the electrostatic potential and the reconnection rate. I will discuss the new experimental scenario and present our detail observations of fast spontaneous reconnection in the VTF current sheet.