**Supra Arcade Detections in the Earth’s Magnetotail**

**Adam Kobelski**

The University of Alabama in Huntsville

**Sabra L Savage**

Department of Physics and Astronomy, West Virginia University, Morgantown, WV, USA

**David M. Malaspina**

Center for Space Plasma and Aeronomic Research, University of Alabama in Huntsville, Huntsville, AL, USA

**Marsahel Space Flight Center, Huntsville, AL, USA**

**Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, CO, USA**

**Context:**

Pinpointing the location of a single reconnection event in the corona is difficult due to observational constraints, although features directly related to reconnection are observed using a variety of space-based and ground-based instruments. One of the key features of reconnection is the formation of a supra arcade (SAD), which is a region of enhanced density and magnetic field. These features are important for understanding the dynamics of reconnection in the magnetotail and the generation of high-speed plasma flows.

**Abstract:**

Pinpointing the location of a single reconnection event in the corona is difficult due to observational constraints, although features directly related to reconnection are observed using a variety of space-based and ground-based instruments. One of the key features of reconnection is the formation of a supra arcade (SAD), which is a region of enhanced density and magnetic field. These features are important for understanding the dynamics of reconnection in the magnetotail and the generation of high-speed plasma flows.

**Corona**

**Magnetotail**

**Solar Wind**

**Plasma Sheet**

**Current Sheet**

**Chromosphere**

**Ionosphere**

**Magnetopause**

**Dissipation Front**

**Reconnection Region**

**In Situ SADs:**

In contrast to solar flares, events in planetary magnetospheres occur in the form of solar energetic particle (SEP) events. SEP events are observed as rapid but temporary changes in the magnetic field of the magnetotail, which are related to post-reconnection retracting magnetic field lines. In planetary magnetospheres, similar events to solar flares occur in the form of SADs.

**References:**


**In Situ SADs:**

In contrast to solar flares, events in planetary magnetospheres occur in the form of solar energetic particle (SEP) events. SEP events are observed as rapid but temporary changes in the magnetic field of the magnetotail, which are related to post-reconnection retracting magnetic field lines. In planetary magnetospheres, similar events to solar flares occur in the form of SADs. Dipolarization fronts are observed as rapid but temporary changes in the magnetic field of the magnetotail.

**Conclusions:**

In the Earth’s magnetotail, wakes of reconnection appear behind dissipation fronts which are following post-reconnection loops. The plasma sheet is a region of enhanced density and magnetic field. These features are important for understanding the dynamics of reconnection in the magnetotail and the generation of high-speed plasma flows.

**Plasma Inflow**

**Plasma Outflow**

**Plasma Sheet**

**Current Sheet**

**Chromosphere**

**Ionosphere**

**Magnetopause**

**Dissipation Front**

**Reconnection Region**

**References:**