

# SM23C-3226 - Swarm Observations of Dawn/Dusk Asymmetries Between Pedersen Conductance in Upward and Downward Field-Aligned Current Regions



Tuesday, 10 December 2019



13:40 - 18:00



Moscone South - Poster Hall

## Abstract

The ESA Swarm mission has opened a new window on the phenomenon of magnetosphere-ionosphere coupling and field-aligned currents systems. Characteristics of these systems can be calculated from in situ LEO observations when crossing static current sheets. In this study, we focus on analyzing Region 1 and Region 2 Birkeland current systems using electric and magnetic field measurements from the Swarm A and B satellites during dawn-dusk passes. We determine Pedersen conductances for each of the current regions from a linear relation between electric and magnetic field measurements for the static fields. These conductances are found to be consistent with empirical models that account for particle precipitation and solar illumination. However, Pedersen conductances are larger in upward current regions, especially in the dawn sector. The average difference between the region 2 (upward) and region 1 (downward) Birkeland current Pedersen conductances in the dawn sector is 1.01 S, which we attribute to dawn-side energetic electron precipitation, commonly associated with substorm electron injections. These results illustrate that M-I coupling via particle precipitation also has a significant effect on electrodynamic coupling via Birkeland currents.

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