# A MODEL FOR WESTWARD AND EASTWARD SUBAURORAL ION DRIFTS

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The pre-midnight magnetosphere is dominated by strong meso-scale electric fields and the associated convective motion, the so-called subauroral polarization stream (SAPS), in the region just outside the plasmasphere. These phenomena are located on subauroral magnetic field lines and have their imprint on the ionosphere. They correspond to strong electric field regions that often become narrow (1-2 degrees invariant latitude), with very intense fields, giving rise to subauroral ion drifts (SAID) of more than 1 km/s in the ionosphere. Such rapid ion drifts are predominantly westward, but recent satellite observations of the ionosphere have revealed occasional eastward ion drifts with speeds larger than 1 km/s and widths of 1-2 degrees, events that have been called abnormal sub-auroral ion drifts (ASAID). The goal of this contribution is to demonstrate how a model that has been put forward earlier to explain SAID can also produce the observed features of ASAID. This magnetosphere-ionosphere coupling model considers the effects of flow shear across the interface between hot injected plasmasheet or ring current material and colder plasmasphere or plasmatrough plasma. Such flow shears tend to intensify the finite gyroradius space charge effects at the interface. The model indicates that the interface can then become the source of an electromotive force that is coupled through field-aligned currents to the subauroral ionosphere. We discuss the magnetospheric configuration that would be required for ASAID, and how it differs from that needed for the more common SAID.

subauroral ion drift, subauroral polarization stream, magnetosphere-ionosphere coupling

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