

The comparison of plasma flow configuration and magnetic field configuration related field aligned currents in the ionosphere

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The nature of field aligned currents that carry momentum and energy between the magnetosphere and ionosphere is representative of magnetic field perturbation, which is directed perpendicular to background magnetic field, and plasma convection. Both of magnetic field perturbation and plasma convection is transmitted along to the direction of the ambient magnetic field. Sometimes we may simply approximate that the relation between plasma convection and magnetic field perturbation is a one-to-one correspondence. Strictly speaking, however, this relation is not such simple but it could hold more complicated correspondence suggested by MHD basic equations. The study of the signature where and when this relation can be fined is very important to understand M-I coupled system.

We will try to analyze this relation in the F region ionosphere using plasma flow data obtained by SuperDARN and by magnetic field data from low altitude satellites.