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## Inversion and direct observations of the auroral current system

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Auroras on the ionosphere (100km altitude) is controlled by the magnetosphere through field-aligned currents (FAC). FAC has so far been studied by two different methods. One is polar-orbiting satellite observations, measuring sheet-like FACs quite accurately. However, the satellite observations are limited along their trajectories. Statistical studies are thus necessary to obtain global maps of FAC. The other method is the inversion of ground magnetic field data. This inversion estimates global snapshots of FACs. It is reported that the direct observations and the inversion yields different spatial distributions of FACs during disturbed periods. In the present study, we will modify the assumptions and/or parameters in the inversion method to match its results to the direct observations.

Keywords: aurora, substorm, field-aligned current, geomagnetic variati, geomagnetic field, inversion