

## CAHMP 衛星の磁場データを用いた中低緯度電離層電流の再構築

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## Ionospheric current system derived from CHAMP using DECS method at low and middle latitudes

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The technique of 1-dimensional spherical elementary current systems (1D SECS) is one way to determine ionospheric and field-aligned currents (FAC) from magnetic field measurements made by LEO satellites. The SECS method consists of two sets of basis functions: divergence-free (DF) and curl-free (CF), which cause poloidal and toroidal magnetic fields, respectively. The original 1D-SECS method is only applicable at high latitudes, where the FAC can be assumed to be radial. At low/mid latitudes, however, it is not applicable because the FAC is far from being radial. In this study, we modify the original 1D-SECS by reconstructing the current system on a dipole coordinate. This allows the method to be applicable at all latitudes. We name this method Dipole Elementary Current Systems (DECS).

By applying the DECS to the CHAMP magnetic field measurements, we have derived the ionospheric currents including the DF, CF and FAC components. The DF components find good agreement with that derived from MAGDAS/CPMN 210 MM ground magnetometer chain using traditional method (90 deg rotation), lending support for the reliability of DECS at middle and low latitude. In this study, we will focus on results about the inter-hemispheric FAC.