

リングカレントイオンの微細構造：Viking及び
Frejaによる観測とモデリング

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Fine structure of ring current ions: Observations and modeling

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We will show results of numerical simulation about dispersion structure in low-energy (<1 keV) ion distribution which was detected by the Viking (12000 km altitude) and the Freja (1400 km altitude) satellites in morning-noon quadrant at invariant latitudes of >55 deg.

The ion dispersion is characterized by a clear cut-off around energies less than 1keV and the maximum intensity of the ion flux takes place near the cut-off energy. The cut-off energy decreases with decreasing and increasing invariant latitudes. Therefore this dispersion is called 'wedge-like' dispersion. So far, the physical process concerned with this phenomenon has been unknown. We have performed the numerical simulation that solves the differential flux of ions newly injected from the night side plasma sheet. On the basis of the results of the numerical simulation, we attribute the low-latitude part of the wedge-like dispersion to the time-dependent ion drift trajectories of ions. The simulation also suggests that the multiple dispersion frequently observed results from temporal variation of the source distribution function, i.e., the latitudinal variation in the wedge-like dispersion that was rapidly detected by Viking and Freja in the morning-noon quadrant reflects the temporal history of the source distribution function in the nightside plasma sheet with a delay time of several hours and more. However, the result of this simulation does not agree with the high-latitude part of the wedge-like dispersion. This may

indicate that realistic models of the electric and magnetic fields need to be included in the model.