Effects of the Betatron Drift on the Plasmaspheric Plasma and on the Radiation Belt Particles

Hiroshi Oya [1]

[1] Geophysical Ist. Tohoku Univ.

As results of the studies on the plasmaspheric plasma density distribution detected by the PWS experiment on board the EXOS-D (Akebono) satellite, the plasma drift due to induction electric fields that are caused by time dependent variations of the local magnetic field intensity has been confirmed; and the drift is called "Betatron Drift". As results of studies on application of the betatron drift process to the high energy particles in the radiation belt, it has been disclosed that the high energy particles in the radiation belt disappear from the original region toward outside, in the main phase of magnetic storms while rapid inward motion takes place in the recovery phase of the magnetic storms.

As results of the studies on the plasmaspheric plasma density distribution detected by the PWS experiment on board the EXOS-D (Akebono) satellite, the plasma drift due to induction electric fields that are caused by time dependent variations of the local magnetic field intensity has been confirmed; and the drift is called "Betatron Drift". In the time of negative change of Dst, plasma makes exodus towards plasma sheet in the magnetic-tail while the plasma makes immigration into the inner plasmasphere from the plasma sheet region in the time of the recovery phase of magnetic storms. As results of studies on application of the betatron drift process to the high energy particles in the radiation belt, it has been disclosed that the high energy particles in the radiation belt disappear from the original region toward outside, in the main phase of magnetic storms while rapid inward motion takes place in the recovery phase of the magnetic storms.