[포SS-07] Low frequency instability associated with magnetic dipolarizations in the near-tail plasma sheet as seen by the THEMIS observations

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Using the magnetic field data obtained by the THEMIS satellite observations in the near-tail, we examined dipolarization events that occurred at X ~ -8.8 to 11.3 R_E in the pre-midnight region in association with three independent substorms. These dipolarizations are characterized by low frequency instability, the oscillation amplitude of which starts to grow a few minutes prior to dipolarization onset time and maximizes near the onset time. The frequency of the growing waves is mostly ~0.007 Hz to ~0.015 Hz which is well below local proton gyro frequency for all events studied here. This frequency regime is consistent with what has been suggested for the ballooning mode instability. Also, the magnetic fluctuation at the frequency almost always involves a compressional component, which also possibly implies involvement of interchange-ballooning type motion. We suggest that a rigorous test for a solid conclusion of the ballooning instability is needed in future, in particular, regarding the question if the perpendicular wave number of the instability is much larger than the parallel wave number, $k_{\perp} >> k_{\parallel}$. Our preliminary study on a statistical significance indicates that it is not uncommon for near-tail dipolarizations to be associated with low frequency instability as the ones reported in this paper.

[박SS-08] The Interplanetary Dust Cloud Complex

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The dust particles originated from asteroids and comets are distributed throughout the inner Solar system and comprise the interplanetary dust (IPD) cloud complex. By analyzing the AKARI IRC All-Sky Survey observations and performing simulations of the IPD dynamics, we have constructed a 3-dimensional model of the IPD cloud and examined details of the small-scale structures in the complex. The brightness of the zodiacal emission (ZE) is determined at 9 and 18 μm. The resulting ZE emps enabled us to fix the longitude of ascending nbrigof the cloud's symmetry plane at 75°.0 ± 0°.3. By applying the Fourier-filtering toacal emps, we have discovered a new asteroidal dust band and revealed band-features that have so far bann unknbwy applyynthesized dynamicallya cal resonaouddust ring around thl Earth's orbit aResults of the simulations clearly indicate that cal resonaouddust particles fill vicinity of thl Earth and contributeparticles fur imounts to thl t aal ZE brightness in the directions of b ah ec apion imoes applude o yynthesized the cometary dust trail of 22P/Kopff aComparisiscovered yynthesized and observed trails ying ths that 22P/Kopff supplies, to the IPD cloud, dust particles at a rate of 8 ± 4 kg/sec. If all the periodic comets are assumed to emit dust at this rate, the total dust supply rate of periodic comet amounts to ~2000 kg/sec, which is far smaller than the rate, ~104 kg/sec, required to maintain the IPD cloud (Grün et al. 1985). The periodic comets may not be a dominant source of the IPDs.