



國立中央大學太空科學與工程學系
*Department of Space Science and Engineering,
National Central University*

專題演講

Energy Dependence of Electron Field-Aligned Anisotropy During Dipolarization at Earth's Tailside

Speaker : 汪愷悌 教授

(淡江大學 航空太空工程學系)

Time : 109 年 12 月 7 日 星期一 15:00-16:00

Place : 健雄館(科四館) S4-811 教室

摘要/Abstract :

Quantified changes in northward-southward field-aligned anisotropy (η) for pitch-angle distributions (PAD) of electrons at sixty-two dipolarization sites near magnetic equator in the inner plasma sheet around 10 Earth radii at tailside from the year of 2008 to 2011, observed by THEMIS mission, are investigated. Data of electrons with energies ranging from 7 eV to 26keV measured by ElectroStatic Analyzer (ESA) are selected for analysis. Particular trends are found to exhibit on the energy dependence of η in thirty-eight dipolarization sites, either northward η or southward η , or both. That is to say, before dipolarization, the value η peaks at about a few tens to a few hundreds of eV, while this value decreases during dipolarization and the peak shifts to higher-energy level between a few hundreds to a few thousands of eV. The ratios between the bounce time of electrons at different energies derived from TS05 field model and the dipolarization time are found to be mostly residing in values less than 1 at the aforementioned levels of energy transitions for peak η , which implies that the effectiveness of adiabatic Fermi acceleration may contribute to the cause of the particular trend. To examine other factors which may affect the energy dependence of η , the AL index and the observed electric fields by Electric Field Instrument (EFI) at the event periods are also analyzed. We find almost no events with such particular trend occurred when the minimum AL index during dipolarization period is less than -190. In addition, these particular-trend events are also not found when the observed dawn-to-dusk electric fields are larger than 30 mV/m. These findings suggest that the very disturbed geomagnetic activities and large electric fields may provide other accelerations for electrons resulting in different energy dependence of η .

※歡迎聽講※

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