

引用本文:

林炯惠, 邓晓华, 袁志刚, 王敬芳. 伴随2000年9月30日sawtooth事件地磁变化和电流楔特征研究[J] 地球物理学报, 2010, V53(10): 2280-2290, DOI: 10.3969/j.issn.0001-5733.2010.10.002

LIN Min-Hui, DENG Xiao-Hua, YUAN Zhi-Gang, WANG Jing-Fang. Characteristics of magnetic variations and current wedge in the sawtooth event on 30 September 2000. Chinese J. Geophys. (in Chinese), 2010, V53(10): 2280-2290, DOI: 10.3969/j.issn.0001-5733.2010.10.002

伴随2000年9月30日sawtooth事件地磁变化和电流楔特征研究

林炯惠¹, 邓晓华^{1,2}, 袁志刚¹, 王敬芳^{1*}

1. 武汉大学电子信息学院, 武汉 430079;
2. 南昌大学空间科学与技术研究院, 南昌 330031

Characteristics of magnetic variations and current wedge in the sawtooth event on 30 September 2000

LIN Min-Hui¹, DENG Xiao-Hua^{1,2}, YUAN Zhi-Gang¹, WANG Jing-Fang^{1*}

1. School of Electronic Information, Wuhan University, Wuhan 430079, China;
2. Institute of Space Science and Technology, Nanchang University, Nanchang 330031, China

摘要

参考文献

相关文章

Download: PDF (833KB) HTML 1KB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 为了解极光电流在sawtooth事件期间的响应情形, 本文利用北半球高纬地磁站台的磁场数据, 建立了以球元基本电流系反演法求得大尺度电离层水平等效电流系分布的方法, 以此研究了2000年9月30日同步轨道LANL卫星观测到的sawtooth事件期间极光电流的变化. 本文将sawtooth注入事件后极区电离层夜侧西向电流增长的特征, 与中低纬地磁基磁北分量正弯扰的特征做比较分析. 两者的观测结果都表明在本sawtooth注入事件期间有电流楔的形成, 且电流楔约有11 h磁地方时(MLT)的宽度. 此外, 中低纬磁弯扰达到最大扰动值的时间一般比高纬电流达到最大扰动值的时间长, 说明影响中低纬磁弯扰变化的电流源较丰富.

关键词: sawtooth事件 电流楔 等效电流系 磁弯扰

Abstract: In order to study the response of auroral electrojets for a sawtooth event observed by LANL satellites on 30 September 2000, we obtain large scale 2-dimensional ionospheric equivalent current systems for the high-latitude ionosphere to study the variations of auroral electrojets during the sawtooth event using spherical elementary current system method with data of high-latitude magnetometers in the Northern Hemisphere. By comparing characteristics of enhancements of nightside ionospheric westward electrojets with those of positive magnetic bays in middle/low-latitude ground magnetic field H components after each sawtooth injection, it is demonstrated that there are current wedges formed during this sawtooth event. The local time width of current wedges suggested by the two observations are both around 11 hours (MLT). In addition, time durations for middle/low-latitude magnetic bays to reach maximum variations were generally longer than those for high-latitude electrojets, implying that source currents for middle/low-latitude magnetic bays are multiple.

Keywords: Sawtooth event Current wedge Equivalent current systems Magnetic bays

Received 2010-06-02;

Fund:

国家自然科学基金(40890163, 40974088, 40604021)和教育部重大基金(307019)共同资助.

About author: 林炯惠, 女, 1982年生, 武汉大学博士研究生, 主要研究方向为磁层电离层耦合. E-mail: linmhu@gmail.com

链接本文:

<http://www.geophy.cn/CN/10.3969/j.issn.0001-5733.2010.10.002> 或 <http://www.geophy.cn/CN/Y2010/V53/I10/2280>

Service

- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- Email Alert
- RSS

作者相关文章

- 林炯惠
- 邓晓华
- 袁志刚
- 王敬芳