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## ESW在磁尾磁场重联耗散区分形线附近的观测特性及其作用

李世友;邓晓华;王敬芳\*

武汉大学电子信息学院, 武汉 430079

Characteristic and role of ESW in the separatrix of reconnection in the magnetotail

LI Shi-You; DENG Xiao-Hua; WANG Jing-Fang\*

Department of Space Physics, School of Electronic Information, Wuhan University, Wuhan 430079, China

摘要

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摘要 磁场重联是空间能量释放和转换的重要机制.静电孤立波(ESW)虽然在空间中有广泛观测,但在磁场重联附近少有直接观测,对它在磁场重联附近的特性了解甚少.通过Geotail卫星对一个磁场重联事件的观测,仔细分析了其边界层上观测到的静电孤立波的特性,并讨论了它对磁场重联的影响.研究表明,亚暴期间在磁尾发生磁场重联,重联区域的分离线附近观测到了大量的静电孤立波,其特性与在其他地方观测到的并没有显著差别,但具有更明显的非线性和孤立性的特征.它们对电子加速和能量耗散有促进作用,加速磁场重联的进程.

关键词 磁场重联, 静电孤立波, 离子耗散区, 电子加速

Abstract: Magnetic reconnection plays a key role in the energy release and transformation in geospace. Though Electrostatic Solitary Wave (ESW) is widely observed in space, direct observation in the vicinity of reconnection site is rare, which makes it ambiguous of the characteristic of ESW associated with reconnection. Here we present a reconnection event for which ESW is ample in the separatrix of the reconnection diffusion region. The characteristic of the ESW associated with reconnection is studied and the effect of ESW on reconnection is discussed. The result shows that, the ESWs observed in the separatrix of reconnection which takes place during a substorm, is more solitary and more nonlinear than that in other regions. The ESW associated with reconnection can propel reconnection process via presenting parallel electric field and accelerate electron.

Keywords [Magnetic reconnection](#), [Electrostatic Solitary Wave](#), [Ion diffusion region](#), [Electron acceleration](#)

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Corresponding Authors: 李世友

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