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1998年8月6日亚暴期间极光电集流指数AE的特征分析

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Manifestation of the AE index in substorms on August 6, 1998

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摘要

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摘要 极光电集流指数(AE)被广泛用来定量描述由电离层电流引起的极光带地磁活动。AE指数也是宏观描述亚暴事件强度和发展过程的一个主要指标,它的优点在于简单直观和快速。本文对1998年8月6日系列亚暴事件的极光活动、电流体系和AE指数的形态特征进行了分析。结果表明,伪亚暴期间虽然AE指数大于500 nT且有快速增长和缓慢恢复的形态,但是极光没有明显的极向或者赤道向的扩展,极区电流体系主要呈现对流特征;伪亚暴和亚暴期间AE指数的形态变化没有本质区别,但电集流中心的位置有很大差异。我们进一步分析了台站分布对AE指数计算的影响,探讨了伪亚暴和亚暴期间磁场扰动最大值所处的磁地方时的差异。

关键词 AE指数, 亚暴, 极光电集流, 伪亚暴, 磁地方时

Abstract: Auroral electrojet index (AE) is usually used to quantitatively describe the activity of the geomagnetic field in the polar region. AE is a means to identify the level of a substorm as well. In the present paper, we analyze the characteristics of aurora, ionospheric current system and the AE index. It is noted that for the pseudo-breakup events the variations of AE (>500 nT) clearly show the sudden increase and slow decrease phases. However, aurora does not expand poleward or equatorward, and the ionospheric currents present the features of the magnetic convection. We mainly focus on investigating what time the AE could be used to identify the substorm.

Keywords AE index, Substorm, Auroral electrojet, Pseudo-breakup events, Magnetic local time

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