

空间物理学★测量学

极区电离层对IMF B_z 4次快速转向的响应——EISCAT/ESR雷达观测

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摘要 利用EISCAT VHF和EISCAT Svalbard (ESR) 雷达观测数据, 对2003年2月12日IMF B_z 分量4次快速方向转换期间, 极区电离层, 尤其是极尖/极隙区的响应特征进行了分析研究. 随着IMF B_z 方向的多次快速变化, 地面雷达观测到极尖/极隙区所在位置随着开放-闭合磁力线边界在纬度方向上来回移动. 在此期间, 极区电离层等离子体水平对流多次反向, 表现出与IMF B_z 分量强的负相关性. 进一步分析表明: 极区磁层-电离层系统在日侧对IMF极性变化的平均响应时间约为3 min.

关键词 [极尖/极隙区](#) [行星际磁场](#) [EISCAT/ESR 雷达](#) [磁重联](#)

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Polar ionospheric responses to 4-times rapid turnings of the IMF B_z component—EISCAT/ESR radar observations

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Abstract With the observations from EISCAT/ESR radar on Feb.12 2003, the responses of polar ionosphere, especially those of the cusp/cleft region to the 4-times rapid turnings of IMF B_z component are investigated in this paper. During this event, latitudinal location of the cusp/cleft region was found moving back and forth, likely resulted from the variations of the reconnection sites at the magnetopause which are widely accepted to be ruled by the IMF polarity. Meanwhile, polar ionospheric plasma convection reversed several times, exhibiting strong correlation with the signs of the IMF B_z component. Correlative and timing analysis suggest that the dayside magnetosphere-ionosphere system seems to need an average reconfiguration time of approximate 3 minutes in response to the variations of the IMF polarity in polar region.

Key words [Cusp/cleft region](#); [Interplanetary magnetic field](#); [EISCAT/ESR radar](#); [Magnetic reconnection](#)

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