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崔腾发, 杜学彬, 叶青, 陈军营, 王建军, 安张辉, 范莹莹, 刘君. 中国大陆经纬链地电场日变化. 地球物理学报, 2013,56(7): 2358-2368,doi: 10.6038/cjg20130722

CUI Teng-Fa, DU Xue-Bin, YE Qing, CHEN Jun-Ying, WANG Jian-Jun, AN Zhang-Hui, FAN Ying-Ying, LIU Jun. The diurnal variation of geo-electric field along the longitude and latitude chains in China mainland. Chinese Journal Geophysics, 2013, 56(7): 2358-2368, doi: 10.6038/cjg20130722

## 中国大陆经纬链地电场日变化

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The diurnal variation of geo-electric field along the longitude and latitude chains in China mainland

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摘要

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### 摘要

本文应用中国大陆两条经度链和两条纬度链上共37个地电台站的观测数据,研究了地电场日变化的时/频域特征,结果认为,绝大多数台站的日变化表现为两次起伏的半日波,紧临午前午后出现;按FFT振幅谱由大到小,其主要周期成分依次为12.4/12、8、24 h等,与潮汐调和分量周期一致;纬度效应主要表现为沿经度链的日变化幅度与纬度高/低有关,日变化相位差与当地时差吻合;Loyd季节的J季节日变化幅度最大、E季节其次、D季节最小.讨论了产生日变化主要周期成分的可能原因,认为月日引潮力引起的地面涡旋电流强度变化和太阳风引起的空间电磁活动共同产生了地电日变化的半日波周期成分.

关键词 地电场, 日变化, 周期, FFT, 潮汐

### Abstract:

This paper has studied the time and frequency characteristics of the geo-electric field diurnal variation along the two longitude chains and the two latitude chains, using the data of the geo-electric field observed at the 37 stations along the chains. Accordingly, the following significant results are obtained: the variation appears mainly as semi-diurnal waves twice a day at most of the stations, approximately before and after the noon; according to the big to small order of the FFT amplitude spectrums, the main periods of the diurnal variation are 12.4 h/12 h, 8 h, 24 h, etc, which are in accordance with the periods of the tidal harmonic components; the latitude effect on diurnal variation is manifested by the amplitude changing with latitude along a longitude chain, and the longitude effect is shown as phase difference consistent with the local-time difference between the stations at the same latitude. Furthermore, the amplitude of the diurnal variation is related with the Loyd season, which reduces orderly in J-, E- and D-seasons. The possible reasons for the main periodic components of the diurnal variation have been discussed, as a result, it is believed that the variation of the ground eddy current intensity caused by lunisolar tidal forces and the space electromagnetic activity aroused by the solar wind jointly produce the semi-diurnal period components of the geo-electric diurnal variation.

Keywords [Goelectric field](#), [Diurnal variation](#), [Period](#), [FFT](#), [Tide](#)

Received 2012-12-10;

Fund:

国家自然科学基金(41174059);国家自然科学基金(40474027)资助.

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