

## 宇宙天気事象時に低緯度電離圏へ侵入する電場の夕方異常

# 菊池 崇 [1]; 橋本 久美子 [2]; 海老原 祐輔 [3]; 富澤 一郎 [4]; 田中 高史 [5]; 長妻 努 [6]  
[1] 名大 STE 研; [2] 吉備国大; [3] 京大生存圏; [4] 電通大・宇宙電磁環境; [5] 九大・宙空センター; [6] NICT

## Evening anomaly of the penetration electric fields at low latitude during space weather disturbances

# Takashi Kikuchi[1]; Kumiko Hashimoto[2]; Yusuke Ebihara[3]; Ichiro Tomizawa[4]; Takashi Tanaka[5]; Tsutomu Nagatsuma[6]

[1] STEL, Nagoya Univ.; [2] KIU; [3] RISH, Kyoto Univ.; [4] SSRE, Univ. Electro-Comm.; [5] SERC, Kyushu Univ.; [6] NICT

In this paper, we show evening anomalies of the penetration electric field during the geomagnetic sudden commencements (SC) as measured by the UEC HF Doppler sounder. The HF Doppler frequency deviations of the SC, SCF, are composed of the PFD (preliminary frequency deviation) and MFD (main frequency deviation) corresponding to the preliminary impulse (PI) and main impulse (MI) of SC, respectively. The SCF is (+ -) in the daytime and evening and (- +) in the nighttime. We found that the electric fields in the evening are significantly enhanced with the same polarity as in the daytime. To clarify the property of the SC electric fields, we reproduced the ionospheric electric fields with the global MHD simulation that employs the potential solver as an inner boundary condition of the MI coupling. The reproduced SC electric fields are composed of the preliminary impulse and main impulse, consistent with the HF Doppler observations. Furthermore, the reproduced PI and MI electric fields have the evening anomaly with significant intensification. The good agreement between the simulation and observation tells us that the evening anomaly is due to the asymmetric distribution of the electric potentials caused by the Hall effects and day-night asymmetry of the ionospheric conductivity. We found that the electric fields of the PC5 pulsations and DP2 fluctuations have the similar local time features with the evening anomaly. Consequently, the electric field supplied by the field-aligned currents is subject to the evening anomaly with significant intensification, no matter how the time scale of the disturbances is. The evening enhancement of the penetration electric field would play a crucial role in the ionospheric storms at low latitude.