Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)
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PEM06-P11 会場:コンベンションホール 時間:5 月 26 日 18:15-19:30

大気電場と地磁気日変化の関連
The relationship between the electric field in the lower atmosphere and Sq variations

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The vertical atmospheric electric field (Ez) variations depend on the state of the global electric circuit. Geomagnetic phenomena can influence Ez through ionospheric disturbances [e.g. Kleimenova, 2008]. The daily quiet geomagnetic field variations (Sq variations) are mainly caused by electric field currents flowing in the E region of the ionosphere. It is likely that Sq variations are relevant to Ez variations. In this study, we aim to investigate the relationship between Ez and Sq variations at a low-latitude station. We analyzed the Ez and ground magnetic field data (H) at KAK (G.G. Lat.: 36.2 N, G.G. Lon.: 140.2 E) station during 2006 - 2014. The data was provided by the Kakioka Magnetic Observatory of the Japan Meteorological Agency. In here, we adopt the same definition for Sq amplitudes as defined by Yamazaki et al. [2010]. The daily amplitude of the Sq variation is derived by subtracting nighttime (22-24 LT and 00-02 LT) H values from daytime H (peak) values. Similarly, we calculated the daily Ez variation. The daytime Ez values were selected at the time when daytime H values show their peaks. The obtained Sq and Ez variations show annual and semi-annual variations. The annual variations are clearly seen every year, becoming the smaller values in winter. The semi-annual variations in Ez are clear in 2011 and 2014. As just described, we found similarities between Sq and Ez variations in several respects and ,therefore, conclude that the Ez variations depend on the condition of the ionosphere.

キーワード: 大気電場, 地上磁場
Keywords: atomospheric electric field, Sq