

# Possible geomagnetic $Sq$ abnormal related to great earthquake

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**Abstract.** At about 130°E to 150°E longitude sector, using 20 geomagnetic observatories absolute minutely xyz- three components data from 2009 to 2012, we detect the possible abnormal of geomagnetic solar quiet variation ( $Sq$ ) related to the great Tohoku Mw9.0 earthquake, shocked at 11th Mar.2011, firstly, by NOC analyzing we pick out  $Sq$  variation from observation, then by Spheric Harmonic Analyzing (SHA), we depart the inner and external equivalent currents  $J_e$  and  $J_i$ , well as the two parts model geomagnetic field  $B_e$  and  $B_i$ , as the results,  $J_e$  and  $J_i$ , well as the deviations  $\Delta J_e$  and  $\Delta J_i$ , are distorted in epicenter area at two geomagnetic quiet days of 27th and 23th in Jan. 2011, namely two months before the earthquake, and the x components phase direction changed for MMB ESA KNY OKI stations, besides the enlarged magnitudes at the two quiet days (23th and 27th), especially the different pattern of OKI at 27th, as double maximum of pre-noon and after-noon variation appeared.

**Keywords** geomagnetic  $Sq$ , abnormal, great earthquake