

## 台風の通過に伴うピエゾ磁気応答の観測による応力磁化係数の推定の試み

# 小河 勉 [1]; 小山 茂 [2]  
[1] 東大地震研; [2] 東大・地震研

## An attempt of in-situ estimation of the stress sensitivity by observing the piezomagnetic response to a passage of a typhoon

# Tsutomu Ogawa[1]; Shigeru Koyama[2]  
[1] ERI, Univ. Tokyo; [2] ERI, Tokyo Univ.

In-situ estimation of the stress sensitivity of the piezomagnetic effect due to crustal activities is attempted by observing the piezomagnetic response to a passage of a typhoon with a magnetometer network installed in an earthquake swarm activity area in Izu peninsula. Based on a simple assumption that the elastic crust is a homogeneously magnetized half space, the mathematical expression of the piezomagnetic response due to loading on the ground is analytically derived. Substituting physical parameters and simply modelled distribution of the atmospheric pressure loading on the ground, numerical calculations of the piezomagnetic response show the geomagnetic field variation accompanying the moving typhoon. Comparing the synthetic change of the geomagnetic total intensity with observational results by a typhoon in 2004 passing Izu peninsula, the upper bound of the in-situ stress sensitivity in the observation area is estimated as  $10^{-7} [\text{Pa}^{-1}]$ , which is larger by one and two orders of magnitude than the values obtained by observing the dam magnetic effect and by experimental studies, respectively. The piezomagnetic response to the largest earthquake during the earthquake swarm activity in 2006 is simulated based on the upper bound value of the stress sensitivity. The result shows the detectability of the geomagnetic change amounting to 40 [nT] with magnetometers installed along the coastline in the hypocentral area. Even in a case that the in-situ stress sensitivity is smaller than the upper bound by two orders of magnitude, it was still detectable with the proton precession magnetometers of which the resolution is 0.1 [nT]. Since the expected change of the geomagnetic total intensity accompanying the earthquake swarm activity in the northern part of the magnetometer network, at observation points AJR, OSS and OSK, does not exceed 10 [nT] based on the upper bound value of the stress sensitivity, the detection was hardly expected.