Geophysical Research Abstracts,
Vol. 10, EGU2008-A-05933, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-05933
EGU General Assembly 2008

Atmospheric electric field before the 2005 off-Miyagi earthquake (M 7.2)

I. Tohbo (1), H. Nagahama (1), Y. Omori (1), S. Masuda (2), and Tohoku Electric Power Company (3)

(1) Department of Geoenvironmental Sciences, Graduate School of Science, Tohoku University, Sendai, Japan, (2)Tohoku Intelligent Communications Co., Ltd., Sendai, Japan, (3) Tohoku Electric Power Company, Incorporated., Miyagi Branch Office, Power System Div., Telecommunications Engineering Center, Sendai, Japan (tohbo@dges.tohoku.ac.jp / Phone: +81-22-795-6625)

As one of earthquake precursors, VHF signal anomalies are well known. We have measured the electromagnetic noise intensity in VHF band (49.5 MHz; using discone antenna, located at a height of 478.3 m above sea level) in the Oshika Peninsula, northeastern Japan for last more than two years. Analyzing the difference between VHF data and 5-point moving average of them (noise width) around the time of the off-Miyagi earthquake (M 7.2) on August 16, 2005 and removing meteorological effects, the noise width increased about 2-5 days before the earthquake. Moreover, comparing both the variability of base line and the width of noises with both atmospheric radon concentration and dose rate, there is a good correlativity among them even under the atmospheric stability. Dose rate has a positive correlation with concentration of atmospheric radon linked to preseismic strain releasing near the Oshika Peninsula (see details by Tohbo et al., 2008; EGU2008). Radon emanation from ground can change atmospheric electric parameters. Considering ionization effects from measurement records of atmospheric radon concentration when atmospheric inversion layer occurs, the increment of concentration of small ions was $(5.22\text{-}6.93)\times10^8$ /m^3 and became double as much as atmospheric radon concentration in usual (BG level). Under this concentration, the mass of the ionized air which generated from radon does not have enough electron density to reflect VHF electromagnetic waves, but it can generate pulses of atmospheric electric field up to 10^5 V/m which can induce electric

potential difference to antenna and electromagnetic noise in VHF band. Therefore, the atmospheric electric field due to radon concentration increase reflects strain releasing before the off-Miyagi earthquake.