Geophysical Research Abstracts,
Vol. 10, EGU2008-A-05924, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-05924
EGU General Assembly 2008

Preseismic radon anomalies in atmosphere near the Oshika Peninsula, northeastern Japan

I. Tohbo (1), H. Nagahama (1), **Y. Omori** (1), Y. Ishikawa (2), M. Takahashi (2), H. Sato (2) and T. Sekine (3)

(1) Department of Geoenvironmental Sciences, Graduate School of Science, Tohoku University, Sendai, Japan, (2) Environmental Radioactivity Research Institute of Miyagi, Onagawa, Miyagi, Japan, (3) Center for the Advancement of Higher Education, Tohoku University, Sendai, Japan (big-forest@dges.tohoku.ac.jp / Phone: +81-22-795-6625)

Anomalous radon emanation is often preceded by earthquakes and is also a candidate driving lithosphere-atmosphere-ionosphere interaction. We have measured atmospheric radon concentration from 2005 to 2007. The measuring site (Kozumi monitoring station; 38.4˚N, 141.4˚E) is located in the Oshika Peninsula, Miyagi prefecture, northeastern Japan along the Pacific Ocean where large earthquakes occur frequently (e.g. the off-Miyagi earthquake and the northern Miyagi earthquake). Average values of absorbed dose rate and exposure rate around the site are 32-47 nGy/h (ionization chamber, several meters above the ground) and (8.0-10)$\times 10^{-10}$ C/kg (NaI(Tl) scintillation detector, 2.6 m above the ground), respectively. They depend on the geologic and geographic features. The measurement has been conducted hourly by using a flow-type ionization chamber with an effective volume of 5.2×10^{-4} m^3. Air of several meters above the ground is passed through a glass fiber filter for retrieving radon progenies and aerosols and then is monitored. The atmospheric radon concentration presents the daily change that low concentration in daytime and high in nighttime. This is due to atmospheric stability. The background concentration of atmospheric radon shows the annual variation, i.e., low concentration (20-25 Bq/m^3) in summer and high (35-40 Bq/m^3) in winter. This is characteristic in a coastal region and is considered to be caused by annual wind rose. During the three-year monitoring we determined some anomalies in radon concentration ($>$ 60 Bq/m^3 in summer and $>$

40 Bq/m^3 in winter) that exceed the daily and annual variation. The anomalous radon emanations are related to precursors of earthquakes near the Oshika Peninsula. In particular, atmospheric radon concentration is highly sensitive to $M \geq 6$ earthquakes (epicentral distance: 60-80km, focal depth: 40-50 km). The radon emanation reflects a strain releasing before earthquake near the Oshika Peninsula.