**S151-P001** **Room: Poster Session Hall** **Time: May 22**

# The feature of the Kuril Is. earthquakes by dynamic strain

# Makoto OKUBO[1]; Sadaomi Suzuki[1]; Akio Takagi[2]

[1] TRIES; [2] ADEP

http://www.tries.jp/~okubo

1.Introduction

Great earthquakes occurred at mid-part of the Kuril Islands at Nov. 15, 2006 and Jan. 13, 2007. USGS analyzed the broadband seismogram and estimated the moment magnitudes ($M_W$) of these earthquakes were 8.3 and 8.1 respectively. The earthquake which occurred on November is explained as interplate earthquake by Yamanaka (2006). The other one is explained as outer-rise earthquake by Yamanaka (2007). Though these earthquakes occurred at the neighborhood, there is the difference at long period phenomena, such as Tsunami.

We used the borehole strainmeter records which can respond more broadbandly and analyzed the dynamic strain seismogram to consider the rupture processes of those earthquakes.

2. Analysis

We applied the time-series strain analysis based on Okubo (2005b) to the dynamic strain seismogram. This method can analyze the time-series variation of crustal strain state by the dynamic strain. Four components of the horizontal strain seismograms which recorded at BYB station, which is located at Mizunami, Gifu, central Japan, were used for this analysis. We researched the rupture process of the earthquakes by paying attention to the time variation of the principal strain azimuth.

3. Results

We obtained the results that the Kuril Islands earthquakes have released the seismic moment, which is equivalent to MW8.2, for approximately 100sec. In the case of the earthquake on January we also obtained the results that the principal strain azimuth is different with analyzing frequency range. According to the equation represented by Okubo *et al.* (2005a), the principal strain azimuth means the radial direction. Therefore, we concluded that the ray paths of the strain propagation are different or the release points of the seismic moment are different by the frequency range.

Reference:

Okubo M., Y. Asai, H. Ishii, and H. Aoki, The seismological and geodetical roles of strain seismogram suggested from the 2004 off the Kii peninsula earthquakes, ***EPS***, 303-308, 2005a

Okubo M., Single site earthquake detection by stream strain analysis, SSJ Fall meeting C061, 2005b

Yamanaka Y., EIC note N.184, http://www.eri.u-tokyo.ac.jp/sanchu/Seismo Note/2007/EIC184.html, 2007

Yamanaka Y., EIC note N.183, http://www.eri.u-tokyo.ac.jp/sanchu/Seismo Note/2006/EIC183.html, 2006

Appendix:

$e_{1,2} = e_{rr,tt} \pm e_{rt} \tan Q_{1-rr}$

from Okubo *et al.* (2005a).

$e_{1,2}$: principal strain,

$e_{rr,tt}$: radial,transverse components of strain,

$e_{rt}$: shear strain,

$Q_{1-rr}$: angle between the principal strain with the radial strain.

Assuming the P-wave and/or Rayleigh wave whithout the shear components of strain in the horizontal plane $e_{rt}=0$, we can rewrite the equation:

$e_1 = e_{rr}$

The radial components of strain corresponds to the principal strain.