Geophysical Research Abstracts,
Vol. 10, EGU2008-A-02350, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-02350
EGU General Assembly 2008

Possible aquifer near the fault plane of the 2007 Noto Peninsula Earthquake, central Japan, detected by the passive image interferometry

S. Ohmi (1) and K. Hirahara (2)

(1) Disaster Prevention Research Institute, Kyoto University, Japan (2) Graduate School of Science, Kyoto University, Japan (ohmi@rcep.dpri.kyoto-u.ac.jp / Phone: +81-774-38-4236)

The passive image interferometry technique is applied to the continuous seismic waveform data obtained around the source region of the 2007 Noto Peninsula Earthquake (Mw6.6), central Japan. We computed the autocorrelation function (ACF) of band-pass (1.5 - 10 Hz) filtered seismic noise portion recorded with each short-period seismometer at several seismic stations for each one day.
At one station, which is just above the fault plane, clear increase of the lag time of several phases of the ACF are observed after the mainshock. It is also seen that the time shift is smaller on phases with shorter lag time, and vice versa. One possible interpretation is that these phases are the seismic waves reverberated in a particular layer, in which seismic wave velocity decreased. Multiple reflection in the particular layer causes the elongation of the time shift of each phase, which may show linear increase of the lag time. We plotted the time shift of each phases against the lag time and found that three phases with lag times of 4.6, 5.1, and 5.7 seconds show the expected linear increase of lag time. With simplified assumption, seismic wave velocity decrease in the whole volume and the particular layer are estimated to be 0.4 % and 8 %. If we assume the average P-wave velocity in the whole volume to be 5.5 km/s, the depth of the bottom and the thickness of the layer are 13km and 1.5 km, respectively.
Obtained velocity decrease of 8 % in a layer at 13 km depth is extraordinary large compared to that in the whole volume (0.4 %). This station is located just above the fault plane of the mainshock and many aftershocks occur at this depth range. Therefore the observed large velocity decrease is probably attributed to the rapid injection

of the fluid as well as the generation of damage and cracks near or on the fault plane.