Detecting reflected waves in the triggered seismicity area of Yonezawa, Yamagata-Aizu, Fukushima

*Akiko Hasemi[1], Yoshiyuki Takahashi[2], Tomomi Okada[3]

1.Department of Earth and Environmental Sciences, Faculty of Science, Yamagata University, 2.Earth and Environmental Sciences, Graduate School of Science and Engineering, Yamagata University, 3.Research Center for Prediction of Earthquakes and Volcanic Eruptions, Graduate School of Science, Tohoku University

Seismic activity started on March 18, 2011 in the Yonezawa (Yamagata Prefecture) -Aizu(Fukushima Prefecture) area, where seismicity has been very low before. The 2011 Mw 9.0 Tohoku Earthquake on March 11 is supposed to trigger this activation. Studies on focal mechanisms, the time sequence of events, and seismic wave velocity and Qc structures in this area suggested that an inflow of fluids and overpressure subsurface fluids were the cause of the triggering seismicity. Distribution of subsurface fluids, however, has not been known. A boundary of a region containing fluids reflects seismic waves with a large reflection coefficient. Therefore we detected reflection phases in wave records of the events in this area.
Events that have occurred by January, 2015 with M larger than 2 (about 2500 events) were investigated. Wave records were downloaded from the Hi-net Home Page of NIED. Up to now, horizontal components of N.ATKH, the station closest to the active region (epicentral distance range of 3~15km), and N.YNZH, the second closest station (8~25km) were checked as follows. Records contaminated by another event were removed. S wave arrivals were picked. Considering the epicentral distribution, eight profiles were set. The records of events with epicentral distance within 0.5km from a profile were displayed along the profile. S wave arrivals between traces were aligned, and a band-pass filter and AGC were applied. Record sections were made for the same component of each station.
Later phases were detected between 1.5~8s after an S wave arrival at both stations. If we assume they were from horizontal reflectors, most of reflectors were situated at 10-20km in depth. The later phases could be traced over 1~2km along a profile. It seems that the phase may be traced for a longer distance, if the method to display a profile is improved. We are going to improve the profile, and determine the position of reflector (or scatterer).

Keywords: reflected wave, crustal fluid, triggered seismicity

