

Ground disasters in after-shock area around Hakata Bay resulted from the earthquake off the western part of Fukuoka Prefecture, 2005

Shoichi Shimoyama [1]; Koichiro Watanabe [2]; Toshiro Yamanaka [3]; Toshihiko Ichihara [4]; Hidemi Ishibashi [1]; Kaori Tsukano [1]

[1] Earth and Planetary Sci., Kyushu Univ ; [2] Kyushu Univ ; [3] SCS, Kyushu Univ. ; [4] Fukken Co., LTD.

A big earthquake (Mj 7.0, depth 9km) occurred off the coast of Fukuoka in Genkainada Sea on March 20, 2005. Big shocks of the earthquake attacked Fukuoka City. One person died, and 471 people got injured by the earthquake. Many houses were destroyed completely in Genkai island, Nishi-ku, Fukuoka City. Main shock caused damage of ground liquefaction disaster at the reclaimed and sandy lands in the extensive coastal area of Genkainada Sea and Hakata Bay. Many big cracks and sand volcanos were formed by liquefaction, and the damage of the harbor facilities occurred. Although it was a big earthquake, the tsunami wave did not occur because the seismic fault was a lateral fault.

The lecturers investigated ground disaster in Fukuoka City just after the earthquake outbreak. Damaged land and institutions were recorded and a lot of picture was taken.

After the main-shock, a lot of aftershocks occurred in seismic center and the circumference. After-shocks were also generated from an old geologic faults, Ishido and Uminonakamichi Faults, in Hakata Bay a little remote from the seismic center. After-shocks were smaller in Hakata Bay, but progressed big damage to the sandy ground by lateral flowing because seismic center of after-shocks was shallower (about 5km in depth) and directly underneath after-shock area runs across the big sand bar, Uminonakamichi. Cracks in the ground increased and deepened every big aftershock. 29 stations were measured using a laser surveying instrument in order to make clear relation between aftershock outbreak and crack area expansion.

As a result, the ground expanded once when a big after-shock was generated, and the ground fell greatly afterwards and then ground recovered. The distance and the angle hardly changed.

This example is showing that a big earthquake gives a big shock to old fault of the circumference and causes an after-shock for a long time, and to magnify the ground damage.