

Prototype of standalone tsunami alarm equipment

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It is considered that one of the quickest ways of tsunami evacuation is movement to higher place soon after a strong and long ground shaking. Information from mass media could be helpless sometimes due to power failure. It would be helpful if there is a device which tells risk of coming tsunami.

Strong ground motion means that the source area of the event would be close to the current location, and long ground shake means that the event magnitude would be large. When the strong ground motion continues for more than thirty second, the magnitude of the event could be more than 7.5, and the duration more than sixty seconds could mean occurrence of an event of magnitude 8.5 or more. Whereas the accuracy of magnitude from strong-motion duration is very limited, it would be a valuable information when other information is not available due to power failure or other reasons. Ground velocity obtained by integrating the acceleration can be used for rough magnitude estimation also.

The MEMS (micro electro mechanical systems) sensors are currently available with low cost. Small computer systems are also available. We are developing a low-cost equipment using a MEMS sensor, one-chip microprocessor, and a small computer which could tell possible risk of tsunami with display and voice.

Instrumental seismic intensity could be one of outputs of the equipment. Seismic intensity is usually observed by human in the world. It is considered that rapid grasp of possible damaged area can be done if seismic intensities are reported through the network like as in Japan. Some methods have been proposed as instrumental modified Mercalli scale. It is easy to install those methods in the equipment. The seismic intensity itself could be a trigger of evacuation from tsunami (Hayashi et al., this meeting). In Chile, there is such an evacuation rule based on seismic intensity. Former tsunami alarm in Japan was also based on seismic intensity observed by human. Similar way could be used for the countries where enough seismic network is not deployed yet.

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