



## **The role of seismic tomography for the Earthquake Early Warning system**

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Preparedness and mitigation are basic stages of the Disaster Reduction Planning before a strong earthquake occurs. The Earthquake Early Warning (EEW) system is the knowhow of present century has been developed in Japan as the effective countermeasure in order to protect human safety and property. The gist of the system is in determining of hypocenter parameters within a few seconds by using P-wave data and then broadcasting alarm information before the arrival of the large amplitude S-waves. Thus the earthquake hazard assessment is early performed as early as possible at the moment when P-waves are registered by seismic station. Machines, trains, building facilities and so forth, which are located in the danger area must be stopped. Obviously false alarms lead to the economic loss Therefore, it is essential to have an effective and reliable alarm system. Strong earthquakes can be at different depths. The deeper event, the more complex the P-wave velocity structure in a volume of medium between source and surface. If velocity structure is well known there is no any problem in the accurate determination of hypocenter location of any deep earthquake as well as in precise finding of local ground places, which are most dangerous for strong shaking. Even if the dangerous event is not deep but with wrecking (as in the case of tsunami) it is necessary well know the geodynamic evolution of seismic structures in the critical areas. The detailed information about velocity structure can be obtained by application of methods of seismic tomography. The paper focus on analyze of the EEW system comparing with statistics of strong earthquakes in Japan and on discussion of outcomes of novel tomography approaches that have been applied for Japan and Europe, of their ability to be useful for this system. The obtained detailed tomography images illustrate that seismic sources are localized in the low velocity zone or at the boundary between low and high velocity zones. This allows to make a conclusion about the planning of the distribution of observation stations, which would be involved to the EEW system.