Designing of Three Stage Seismic Intensity Meter Supported by Earthquake Early Warning

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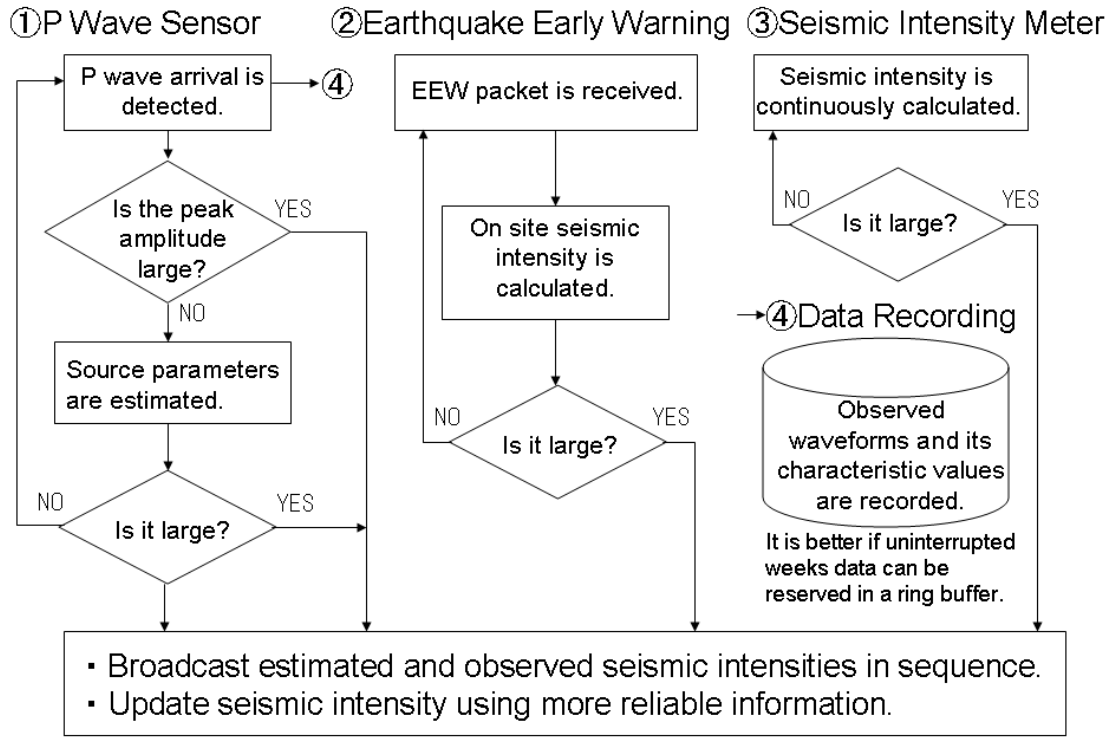
A concept and designing of three stage seismic intensity meter is suggested. The seismic intensity is based on Japan Meteorological Agency (JMA) standard. The system broadcasts three kinds of seismic intensities, 1) seismic intensity estimated from initial stage of observed P wave on site (P wave sensor), 2) seismic intensity estimated from source information broadcasted by Earthquake Early Warning (EEW) network, 3) seismic intensity calculated from observed strong ground motion at the site. Suppositious flow chart of the system is shown in the following figure.



Flow Chart of Three Stage Seismic Intensity Meter

The system consists of general JMA seismic intensity meter and EEW receiving terminal. Hitherto, the two systems are installed separately for different purposes. Furthermore, P wave sensors are mainly installed for controlling industrial plants. A combination of the three implements is expected to produce new demands for earthquake disaster mitigation.

For P wave sensor, not only acceleration records generally used in seismic intensity meters but also high quality velocity records are recommended, because of detecting P wave arrival even in noisy environment. Internet connection is required for catching the EEW information and also for transferring the estimated seismic intensities to a control center.

Installing the three stage seismic intensity meters, 1) post facto broadcasting area of EEW network is expected to be trimmed, 2) people around the seismic meter can be ready for strong ground shaking beforehand, 3) estimated seismic intensity is confirmed with observed intensity. The system is suitable at city halls, schools, amenity facilities, industrial plants, and so on. In case of installing them to primary schools that are expected to be emergency evacuation areas, observed seismic intensity can be used for safety information for the facilities and beforehand information can be useful for preparing aftershocks.

It is expected to create the three stage seismic intensity meters in low cost, to install them to many facilities, and to make network of the meters for advanced Earthquake Early Warnings. I think it is within our reach, because the individual technologies required are already exists.