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REAL-TIME EARTHQUAKE INFORMATION SYSTEM FOR STRUCTURAL HEALTH MONITORING APPLICATIONS IN MONGOLIA

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ABSTRACT

Real-time Earthquake Information System is introduced into Structural Health Monitoring and its applications with earthquake disaster prevention orientations.
The real-time earthquake information system for Earthquake Early Warning (EEW) with Structural Health Monitoring (SHM) function of Tohoku University (1), has developed in regional scale of Miyagi prefecture, and extending to the regional scale as well as international collaboration (2). The system is operating in real-time data transmission through networks from observation sites to data center comprising number of channels depending on the site configuration which combinations of measurements inside buildings. The purposes of the system are, the firstly, the development of warning system based on real-time ground motion data from front site to the usage for target sites, while the secondly, the on-line monitoring the building status based on measurements from well-configured sensors inside building to grasp the dynamic characteristics (3).
Within international collaboration, a part of the system is installed in a building of city government, and the objective building is the 15 story SRC structure built in 2008. Since the operation, the system enables the measurement from micro tremor level to strong motion level and the on-line monitoring of the state of the building. Based on observation in micro tremor level, the 1st vibration mode is 0.9 Hz and 0.8 Hz; and the 2nd mode is 3.2 Hz and 3.0 Hz in corresponding horizontal directions.
The further researches continue not only for the investigation of the dynamic behavior of the building itself, but also earthquake disaster mitigation applications will be developed in taking account of the regional distinctive environments.

REFERENCES

Motosaka et al, (2008), "Development of an integrated early warning and structural monitoring system to real-time earthquake information", AIJ. Technol. Des. Vol. 14, No. 28, 669-674.

Tsamba, T. and Motosaka M., (2013), "Development and Extension of Real-time Earthquake Information system for Earthquake Early Warning and Structural Health Monitoring", EEW Meeting, Kyoto, Japan.

Motosaka.M, Tsamba.T, Yoshida.K and Mitsuji.K, (2012), "Long-term Monitoring of Amplitude Dependent Dynamic Characteristics of a Damaged Building during the 2011 Tohoku Earthquake", *Journal of Japan Association for Earthquake Engineering*, Vol. 12, No. 5, 117-132.

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