



## **An Experimental Study of the Low-cost MEMS-type Seismometer for Structural Health Monitoring**

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The Earthquake Early Warning (EEW) research group at National Taiwan University (NTU) and a technology company have been developing a Micro Electro Mechanical Systems (MEMS) type of accelerometer named Palert designed for EEW purpose. The main advantage of Palert is that it is a relatively low-cost seismometer. On the other hand, due to the high price of commercial hardware of Structural Health Monitoring (SHM) systems, the application of SHM to buildings is limited. Therefore, the low price of Palert devices makes it affordable to general purpose application and would lead to popularization of SHM for buildings. This study serves as a pre-study for this purpose and the feasibility for SHM application for Palert is also verified. In order to monitor the health of the building, the method proposed by Nakata et al. is used to estimate fundamental normal-mode frequency of a steel building in the laboratory of the National Center for Research on Earthquake Engineering (NCREE). The results show that the Palert is reliable to measure the building's response for the most of the normal buildings with less than ten stories. The fundamental normal-mode frequencies estimated using the Palert are quite comparable to the ones estimated using the high-performance accelerometers and data acquisition system. The Palert illustrates the possibility to be used to monitor the health of a building but further studies are still necessary.