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Practical Applications of Low Cost Seismic Network for Producing Quick Shaking Map in Taiwan

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Two major earthquakes of ML greater than 6.0 occurred in Taiwan in the first half of 2013. The vibrantly shakings brought landslides, falling rocks and casualties. This paper presents a seismic network developed by National Taiwan University (NTU) with 401 Micro-ElectroMechanical Systems (MEMS) accelerators. The network recorded high quality strong motion signals of the two events and produced delicate shaking maps within one minute after the earthquake occurrence. The high shaking regions of the intensity map produced by the NTU system precisely indicate the locations of damages and casualties. Equipping with the dense array of MEMS accelerometers, the NTU system is able to accommodate 10% signals loss from part of the seismic stations and maintains its normal functions for producing shaking maps. The system also has the potential to identify the direction of rupture which is one of the key indices to estimate possible damages. The low cost MEMS accelerator array shows its potential in real-time earthquake shaking map generation and damage avoidance.