

## Ground Motion Instrumentation Network and Earthquake Early Warning System for Uttarakhand

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An Earthquake Early Warning System (EEWS) has been developed by Indian institute of Technology Roorkee (IIT Roorkee) for Uttarakhand, a Himalayan province of India. The region behind to set up first EEWS in India for Uttarakhand is that the main central thrust (MCT) and main boundary thrust (MBT) passes through it and central seismic gap exists in its region and seismologist envisaged a big earthquake will hit this region in near future. Under this project, 155 accelerometers have been installed in 53,483 km<sup>2</sup> area in the Himalayan part of Uttarakhand. These accelerometers are installed on the ground floor of government owned offices of Bharat Sanchar Nigam Limited (BSNL) mobile towers and State Wide Area Network (SWAN) available in the province. The average station to station distance is kept between 10 to 20 km which ensure the triggering of more than 6 accelerometers if an earthquake of magnitude greater than 6 triggers in the region. The data is streamed at the central server located in Earthquake Early Warning Laboratory at Centre of Excellence in Disaster Mitigation & Management in IIT Roorkee through private network of BSNL and SWAN on 24 × 7 basis. The location of installed accelerometers and their streaming at the Earthquake Early Warning Laboratory is shown in figure 1. Whole system is automatic and the early warning parameter is peak displacement (Pd). When an earthquake of magnitude greater than 6 will strike in the instrumented region an earthquake warning will be issued to public through the sirens. The early warning sirens are installed in the public offices, government buildings, schools, colleges of the two major cities, Dehradun and Haldwani, and all 13 district emergency operation center of the province. After hearing, earthquake alarm, people can take necessary precautionary measures. This paper presents the details of instrumentation and working of the EEWS.

Fig 1. Installed accelerometers are shown in Uttarakhand' s map. MCT and MBT passes through the Himalayan province. Streaming of the data from accelerometer to central server at EEW laboratory is shown in the snapshot.

Keywords: Instrumentation, Accelerometers, Seismic gap, EEWS, Sirens

