



Establishment of Antakya Basin Strong Ground Motion Monitoring System

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Turkey is located in one of the most active earthquake zones of the world. The cities located along the North Anatolian Fault (NAF) and the East Anatolian Fault (EAF) are exposed to significant earthquake hazard. The Hatay province near the southern terminus of the EAF has always experienced a significant seismic activity, since it is on the intersection of the northernmost segment of Dead Sea Fault Zone coming from the south, with the Cyprean Arc approaching from south-west. Historical records extending over the last 2000 years indicate that Antakya, founded in the 3rd century B.C., is effected by intensity IX-X earthquakes every 150 years. In the region, the last destructive earthquake occurred in 1872. Destructive earthquakes should be expected in the region in the near future similar to the ones that occurred in the past.

The strong response of sedimentary basins to seismic waves was largely responsible for the damage produced by the devastating earthquakes of 1985 Michoacan Earthquake which severely damaged parts of Mexico City, and the 1988 Spitak Earthquake which destroyed most of Leninakan, Armenia. Much of this devastating response was explained by the conversion of seismic body waves to surface waves at the sediment/rock contacts of sedimentary basins.

“Antakya Basin Strong Ground Motion Monitoring System” is set up with the aim of monitoring the earthquake response of the Antakya Basin, contributing to our understanding of basin response, contributing to earthquake risk assessment of Antakya, monitoring of regional earthquakes and determining the effects of local and regional earthquakes on the urban environment of Antakya. The soil properties beneath the strong motion stations (S-Wave velocity structure and dominant soil frequency) are determined by array measurements that involve broad-band seismometers. The strong motion monitoring system consists of six instruments installed in small buildings. The stations form a straight line along the short axis of Antakya basin passing through the city center. They are equipped with acceleration sensors, GPS and communication units and operate in continuous recording mode. For on-line data transmission the EDGE mode of available GSM systems are employed. In the array measurements for the determination of soil properties beneath the stations two 4-seismometer sets have been utilized. The system is the first monitoring installment in Turkey dedicated to understanding basin effects. The records obtained will allow for the visualization of the propagation of long-period ground motion in the basin and show the refraction of surface waves at the basin edge. The records will also serve to enhance our capacity to realistically synthesize the strong ground motion in basin-type environments.