

Aspects of $M \geq 4$ earthquakes in the Taipei Metropolitan Area during 1973 – 2005

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Abstract

The Taipei metropolitan area is the political, economic, and cultural center of Taiwan. Since the area is situated on the subduction zone, where the Philippine Sea Plate is subducting underneath the Eurasian Plate, much attention is focused on seismic hazard mitigation. This study investigates the epicentral distribution, depth distribution, and temporal sequences of $M \geq 4$ earthquakes occurred during 1973 – 2005. In addition, historical destructive events will also be explained. The earthquakes can be divided into two groups, with a depth difference of about 20 km: one for shallow events with focal depths ranging 0 – 40 km and the other with focal depths larger than 60 km. The deep events occurred along the subduction zone with a dip angle of about 70° . Shallow earthquakes mainly located in depth range from 0 – 10 km north of 25.1°N , and down to 35 km in depth for those south of 25.1°N . After 1988, no $M \geq 4$ shallow event was located within this area. Deep events occurred more or less uniformly during the study time period. The annual number of shallow earthquakes decreased with time from 1973 to 1988, and varies year from year for deep events. In addition, the FR/QP transition model is applied to interpret the depth distribution of shallow earthquakes.