Geophysical Research Abstracts, Vol. 7, 00621, 2005
SRef-ID: 1607-7962/gra/EGU05-A-00621

Spatial temporal modelling of seismic activity in Peninsular India and its implications on seismic zoning

K. Jaiswal and R. Sinha

Department of Civil Engineering, Indian Institute of Technology Bombay, Powai, Mumbai (jaiswal@iitb.ac.in)

Peninsular India (10-26˚ N and 68-90˚ E) has been known to be one of the oldest and seismically most stable landmass of the Indian plate in its long history unlike other continental regions of the world. However recent history (last two centuries) based on available catalog data shows that more than five damaging earthquakes with magnitude greater than 6.0 have occurred in this region indicating recent increase in seismic activity. Occurrence of recent damaging earthquakes in the earlier known quietest zone has led to redesignating such zones to higher seismic hazard level. The current paper estimates seismic hazard associated with Peninsular India on probabilistic framework using observed seismic activity and known geologic characteristics of the region. The seismicity parameters have been estimated taking spatial and temporal variation of seismic activity incorporating completeness criteria for various spans of catalog. Seismic source zones for the region have been defined on the basis of large-scale geological features and used as basis for assigning maximum possible earthquake potential. Due to the poorly known attenuation characteristics of the study region, three different appropriate attenuation models have been used to define the prediction of ground motion for Peninsular India. Three different source models have been taken for current analysis based on observed spatial and temporal variation of the activity in Peninsular India. Each of the models has been constrained to preserve the historic rate of moderate size events as observed from the catalog data. Hazard maps for Peninsular India have been prepared using a convolution scheme based on weighting and incorporating various uncertainties involved in modelling different parameters. The comparison of probabilistic seismic hazard map developed in the present investigation with the prevalent seismic hazard map available in the Indian Standard Code for Earthquake Resistant Design shows that the existing design parameters in the code may signifi-

cantly underestimate the seismic hazard in some of the regions of Peninsular India.