

RELATIONS BETWEEN THE SEISMICITY AND THE TECTONICS IN A GLOBAL SCALE

T.M. Tsapanos

Aristotle University of Thessaloniki, Dept. of Geophysics,
Thessaloniki 54006, Greece

The spatial distribution of two seismic parameters is studied in a world-wide scale, for 25 predefined seismic regions, with a view to comparing this with the local tectonics. These parameters can be considered as measures of quantitative seismicity. For this purpose a new global, homogeneous and complete catalogue of earthquakes, is used, with magnitudes $M_s \geq 5.5$.

The seismic parameters used, are the ratio a_0/b , which expresses the most probable largest annual magnitude for a surface covering 10.000 Km² (this also could be expressed as a magnitude M_0) and the mean return periods, T_m , of the earthquakes.

The results obtained from the distribution of both seismic parameters, clearly indicated, that the Earth is divided into three categories (or groups) of seismicity, which forms seismic regions of high, low and very low seismicity. A good relation between the seismicity and the tectonics was found. Thus all the seismic regions of the circum-Pacific belt, belong to these of high seismicity and this is associated with the subduction process which occurred at this belt. Regions of low seismicity are found to be, the whole continent of Asia, the east Mediterranean basin, the west coasts of U.S.A and Canada, as well as the area of Argentina. Mid-oceans ridges are estimated to be regions of very low seismicity and to the same category are the western Mediterranean basin and the area of Manchuria to the sea of Okhotsk as well.

It was also showed that the seismicity examined, where we used the method of the mean return periods, is depending on the magnitude interval for which it was calculated.