

Seismicity and seismotectonics of Libya: as an example of intraplate environment

Emad A. Al-Heety

Abstract This investigation covers the area bounded by latitudes 20° to 33° N and longitudes 9.5° to 25°E. The seismicity of area for the period 1900–2005 is evaluated. Libyan earthquake catalog is complete for the 4.4 M and greater over a 70-year span. The overall seismicity of Libya is found to be low to intermediate. The seismic activity is concentrated in three zones of the northern Libya. Outside of these zones, epicenters are scattered and sparsely distributed. The b value for Libya is –0.71. This low b value is a characteristic feature for intraplate environment. A seismotectonics map is constructed for Libya. It shows that the epicenters agree well with the distribution of the major tectonic features. Majority of seismic activity in Libya is concentrated near Hun Graben and Cyrenaica, and the locations of earthquakes are near the transition zones between the stress domains in northern Libya. These transition zones are locations of stress concentration. This investigation suggests that the stress concentration theory is generally considered as causative mechanism for seismicity of Libya.

Keywords Seismicity . Seismotectonics . Libya . Intraplate environment