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Reassessment of the Seismicity and seismic hazards of Libya

A. Ben Suleman and A Elmeladi
Libyan Center for Remote Sensing and Space Science (abdunnurs@yahoo.com)

The tectonic evolution of Libya, located at the northern extreme of the African continent, has yielded a complex crustal structure that is composed of a series of basins and uplifts. The present day deformation of Libya is the result of the Eurasia-Africa continental collision. At the end of the year 2005, The Libyan National Seismological Network was established to monitor local, regional and teleseismic activities, as well as to provide high quality data for research projects both locally and on the regional and global scale. This study aims to discuss the seismicity of Libya by using the new data from the Libyan national seismological network and to focus on the seismic hazards.

At first glance the seismic activity map shows dominant trends of seismicity with most of the seismic activity concentrated along the northern coastal areas. Four major seismic trends were quite noticeable. A first trend is a NW-SE direction coinciding with the eastern boarder of the Hun Graben. A second trend is also a NW-SE direction in the offshore area and might be a continuation of this trend. The other two trends were located in the western Gulf of Sirt and Cyrenaica platform. The rest of seismicity is diffuse either offshore or in land, with no good correlation with well-mapped faults.

Detailed investigations of the Libyan seismicity indicates that the Libya has experienced earthquakes of varying magnitudes and that there is definitely a certain amount of seismic risk involved in engineering projects, particularly in the northern regions.

Detailed investigation of the distribution of the Libyan earthquakes in space and time along with all other geological considerations suggested the classification of the country into four seismic zones with the Hun graben zone being the most seismically active zone.