



Seismic characteristics and kinematic models of Makkah and central Red Sea regions, Saudi Arabia

Mashaël M. Al-Saud

King AbdulAziz City for Science and Technology, Riyadh, Saudi Arabia (geom5@yahoo.com, (+966 1) 4826872)

Makkah and central Red Sea regions have been re-evaluated from recent earthquake data analysis. Epicenters of recent seismic activity are concentrated in three local seismic zones. These are: Ad Damm Fault (NE), Nu'man-Makkah-Fattim (NW) and Jiddah-Red Sea (NW) seismic zones. Moreover, an extended seismic zone along the central part of Red Sea is observed. Most of these epicenters are distributed along tectonic faults, as indicated from the subsurface structure analysis of the aeromagnetic anomaly map. Some epicenters of small magnitudes are inaccurately located. The study indicates the existence of large active structural basin south of Makkah region which traverse Ad Damm fault zone with the Red Sea transform faults. Slip vector analyses were carried out for 50 available earthquake focal mechanisms around Makkah region. In Nu'man, Makkah and Fatima structural zones, the slip vectors generally trending NW and NNW. However, in the southern part at the Ad Dam structure zone the slip vector trending NE-SW. These may result from the current complicated drifting motion of Arabian plate away from African plate combined with the opening of the Red Sea Rift.

Keywords: Red Sea, Makkah, Fault plane solutions, slip vectors.