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3D Crustal Structure and 3D-b-value in AbuDabbab Seismogenic Source, Northern Red Sea.

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Abu Dabbab seismogenic source region is of unique seismic activity located on the Egyptian Red Sea coast. It's known as earthquake Cannons where the earthquakes are accompanied by a sound of distinct rumbling similar to the sound of a distant quarry blast which is heard by humans for several generations. Seismic activity of Abu Dabbab becomes very well determined after establishing of the Egyptian National Seismic Network 1997. Joint earthquake tomography inversion of local and regional data has been performed in order to image the crustal heterogeneity and the origin of the cannons earthquakes. Most previous studies suggested that this activity is of magmatic origin. We found the seismicity forms an arc shaped cluster that surrounds an aseismic block. This aseismic block has high velocities and a low Vp/Vs ratio. The origin of this seismic activity is probably due an active fault below the non-deformed block of Precambrian Igneous rock reaching a depth of $\sim$10 km. Spatial mapping of the frequency magnitude distribution of the earthquakes and 3D-b-value indicate a strong variation moreover high b-value (1.4) at depth downward the rigid block. The Combined interpretation of the seismic imaging and 3D b-value in addition to the seismological and the geophysical observations revealed the tectonic origin of the earthquake activity in this area which is related strongly to the evolution of the crust in the Red Sea and its tectonic activity.
KEYWARD:Three dimensional Crustal Structure - Seismic activity -Three-D b-value- Red Sea tectonics- Tectonic activity