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**Geophysics of the Sirt Basin Rift System, Libya**

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The Sirt basin rift system comprises a vast area in the north-central part of Libya. It is surrounded to the northeast by the Cyrenaica platform; to the south and to the west by the Paleozoic basins of Al-Kufra, Murzoic and Ghadames. This study represents a detailed investigation of the Sirt basin rift system through an integrated analysis of subsurface and geophysical data. Geophysical data used in this study represents Gravity, seismicity and heat flow data. These data suggest that the Sirt basin has a number of features in common with modern and older continental rifts throughout the world.

More than 5000 gravity values were used in the gravity investigations of the Sirt Basin rift system. The Bouguer gravity map indicates that the Sirt Basin is marked by elongate regional gravity maxima and minima trending NW-SE showing a strong correlation with the structural highs (associated with platforms and carbonate buildups) and lows (associated with sedimentary filled troughs) known from drilling.

The seismicity indicates that the rift margins, especially the western margin, are still seismically active. The first motion results suggest that strike-slip and normal faulting is occurring throughout the region. The heat flow data show above average heat flow values in portions of the rift. The heat flow-heat production relationship also indicates a tectonic setting between that of rifting and stable continental interiors.

The Sirt basin was formed by large scale subsidence and block faulting that started in Late Cretaceous time and has continued perhaps to the present. Rocks from Ordovician to through Jurassic in the Sirt basin region are absent due to erosion and/or non-deposition over the crest of the Sirt-Tibesti arch.

