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Seismicity and Stress-Tensor Inversion along the Gulf of Aqaba

The goal of this work was to study the seismicity and to estimate the stress field acting in the Gulf of Aqaba Region. The Gulf of Aqaba earthquakes is mainly concentrated in four zones; the first zone is located in the Hume Basin in the southern entrance of the Gulf. The second zone is located along the Arnona fault between 28.3 – 28.6 and longitude 34.5 - 34.7 degrees; the third zone is located in the Aragonese Basin, the fourth zone is located in the Aqaba Basin. The b-value ranges between 0.4 – 1.1. The technique Stress-Tensor Inversion has been applied to 20 events from the Gulf of Aqaba earthquake sequence for which we have found best fit stresses (plunge and azimuth): σ1=55,60 σ2=34.256 σ3=3,161 and R=0.50. The average misfit between the stress model and all the data is about 5.5°. It was concluded that the maximum regional stress in the Gulf of Aqaba from NE-SW direction, while the minimum regional stress to NW- SE direction (extension).

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