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Earthquake Relocations and Constraints on Lateral Velocity Variations Using the Joint Hypocenter Determination Method along the Gulf of Suez

A total number of 250 earthquakes recorded by more than 5 stations from Egyptian seismic network around the Gulf of Suez were relocated and the seismic stations correction for P-wave is estimated using joint hypocenter determination method. Five stations TR1, SHR, GRB, ZAF and ZET have minus signs in station P-wave travel time corrections and their values -0.235, -0.366, -0.288, -0.366 and -0.058, respectively. It is possible to assume that the underground structure in this area has a particular characteristic of high velocity structure and other stations TR2, RDS, SUZ, HRG and ZNM have positive sign and their values 0.024, 0.187, 0.314, 0.645 and 0.145 respectively. It is possible to assume that underground structure in this area has particular characteristic of low velocity structure. The hypocenter location determined by the joint hypocenter determination method is more precise than those determined by other routine work program. The station corrections reflect not only different crustal condition in the vicinity of the stations, but also the difference between actual and model seismic velocities along each of the earthquake - station ray paths. The stations correction obtained correlate with the major surface geological features in the study area.

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