ISC bulletin with AK-135 velocity model for earthquakes in the Levant and East Mediterranean region

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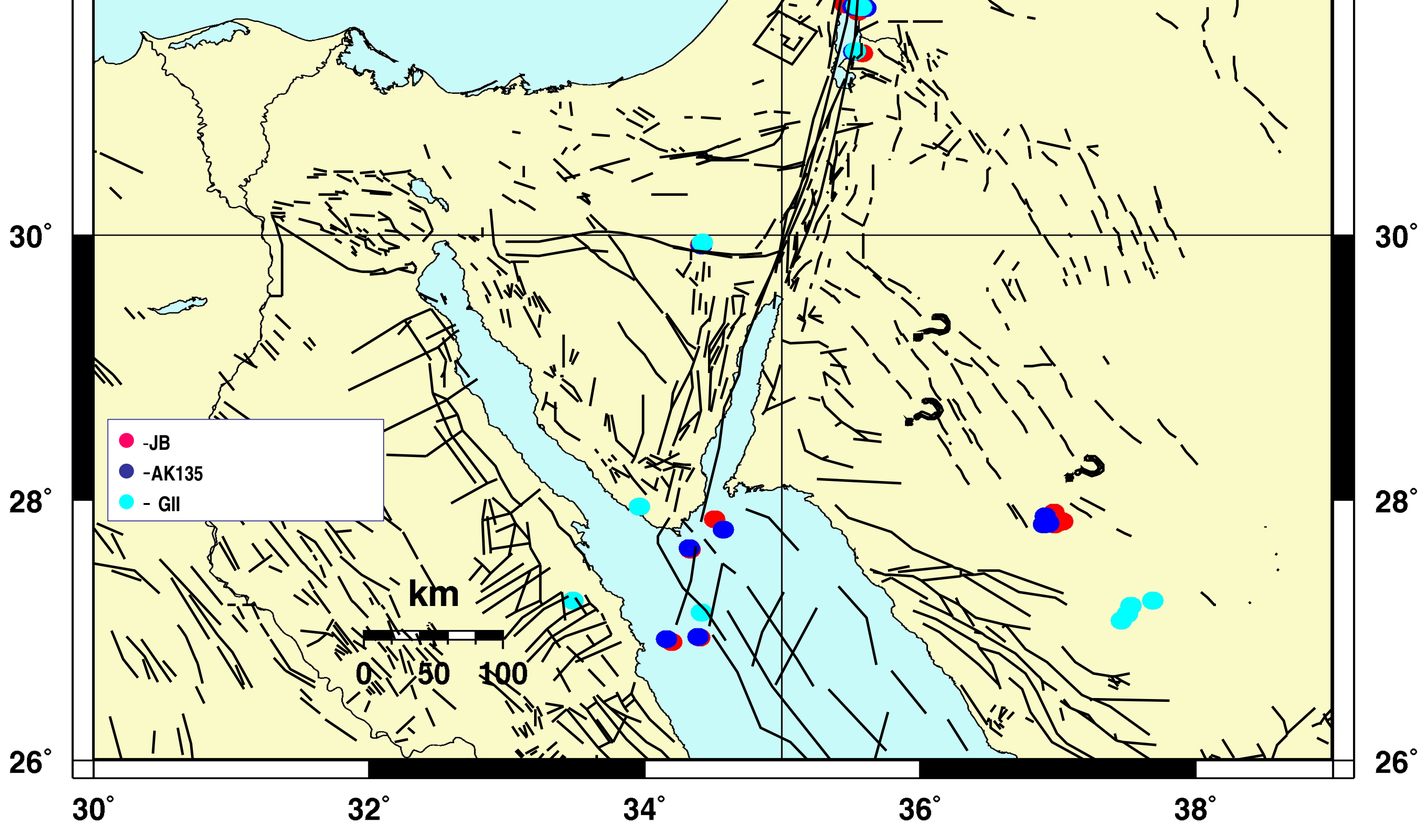
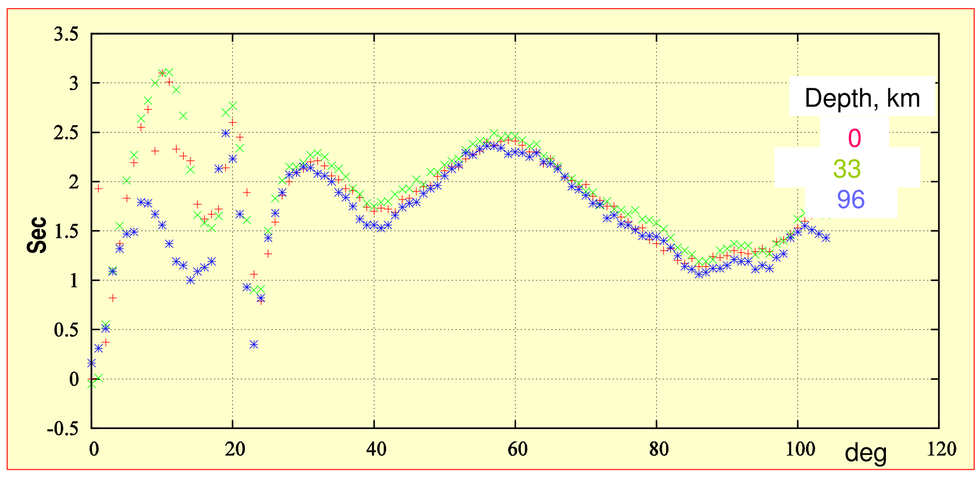
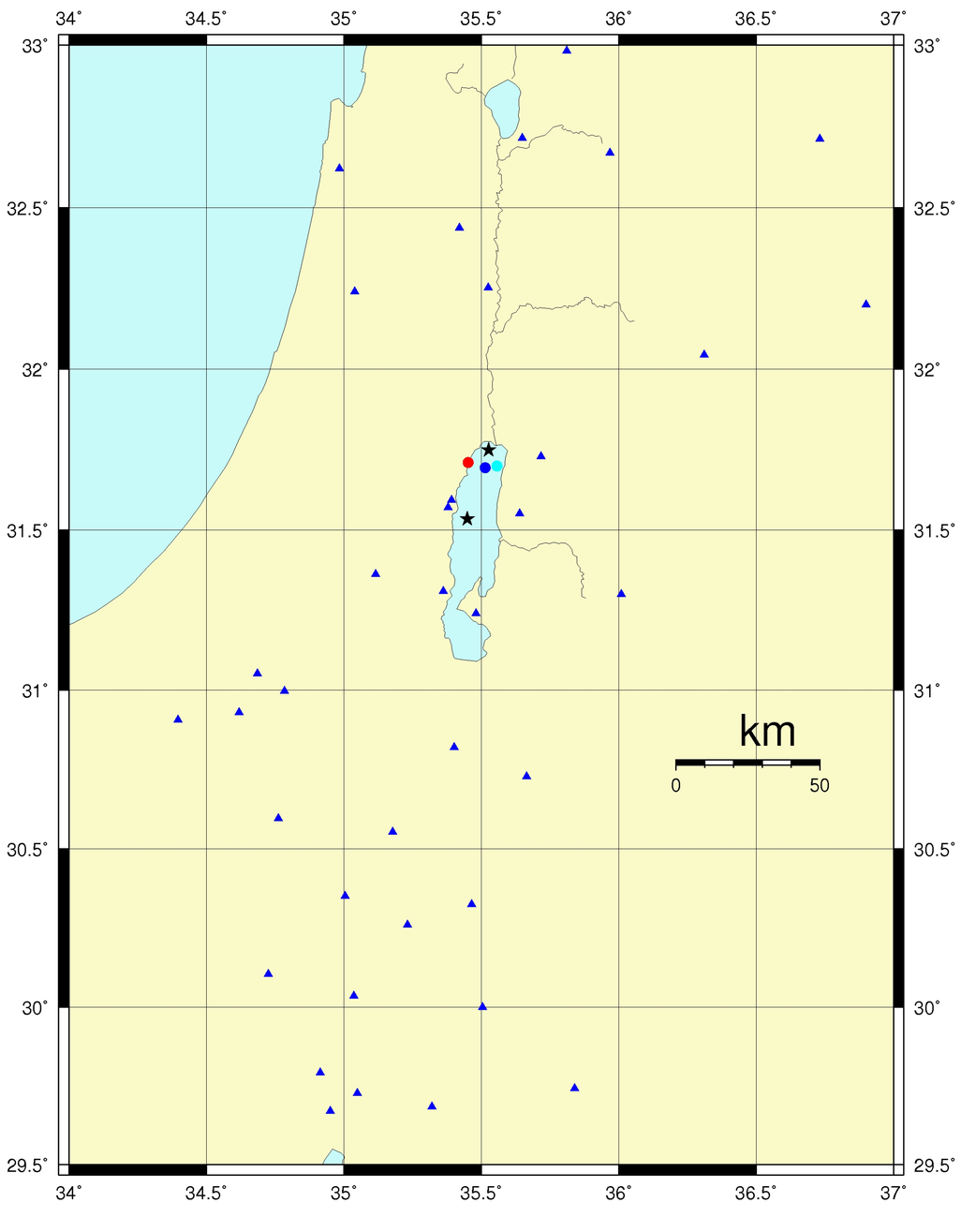
Abstract The IASPEI General Assembly in 2005 recommended that the International Seismological Centre (ISC) consider changing from the old Jeffreys-Bullen spherical velocity model of the Earth to the modern AK135 model. We contribute to the verification process of implementing AK135 model in ISC routine operations by checking ISC location solutions based on AK135 for 50 earthquakes of magnitude M>= 3.5 that occurred in the Levant and the east Mediterranean sea and were also located by the seismic network of Israel (ISN) and the Cyprus (CSN). As expected, the "new" model provides almost the same results as the old JB model and, in general, the location results are in agreement with ISN and CSN solutions. However, there seem to be a greater discrepancy for location solutions west of Cyprus and in the Red Sea. These differences could be attributed mainly to the spatial distribution of the seismic stations used in the calculations and, of course, the calculated travel-time difference.



JB and AK135 P travel-time difference





Earthquake locations in the Levant, using the ISC location algorithm with the AK-135 travel time model, as compared to using JB model, may slightly improve location accuracy.

Example using a GT5 reference event:
A GT5 Earthquake (Dead Sea earthquake of February 11, 2004, Mw=5.1). The high location accuracy by GII (●) is obtained by using calibrated travel time data from near-by calibration explosions (marked by ★ on the map). The earthquake was recorded by more than 650 stations all around the world. The ISC locations are also marked on the map (JB ● , AK135 ●). The JB solution deviates from the GII solution by 10.08 km and the AK135 by 3.8 km.