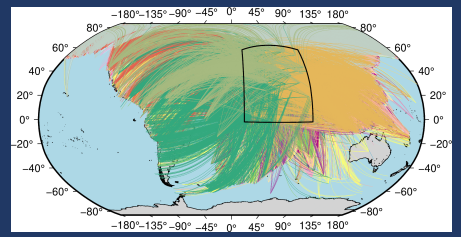
Direct P-Wave Travel Time Tomography of the Middle East

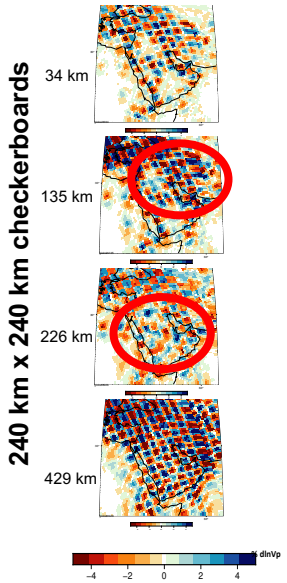
Susini de Silva[1], Ebru Bozdag[1], Guust Nolet[2], Rengin Gok[3], Ahmed Ali[4], and Yahya Tarabulsi[4]
(1) Colorado School of Mines, Golden, CO, USA (2) GeoAzur/UNSA, Sophia Antipolis, France (3) LLNL, Livermore, CA, USA (4) Saudi Geological Survey, Saudi Arabia

Initial Data Set : ISC P arrival times

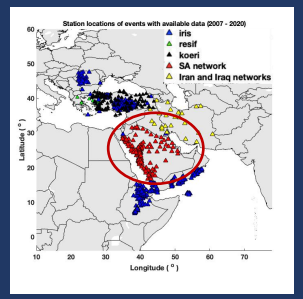
Selection Criterion:
Phase : P
Event year range : 1990 – 2016
Min. distance between two events = 20 km
Event magnitude range: 0 – 9 Mw
Min. worldwide station picks per event = 50



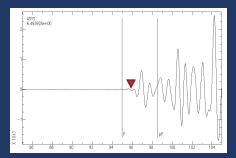
Total number of picks = 3,000,067



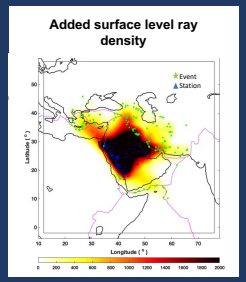
Improved Data Set: ISC P arrival times + P arrival times from waveforms



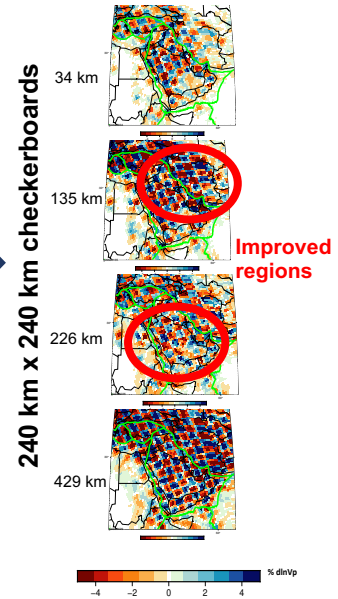
Waveforms recorded by SGS for regional earthquakes



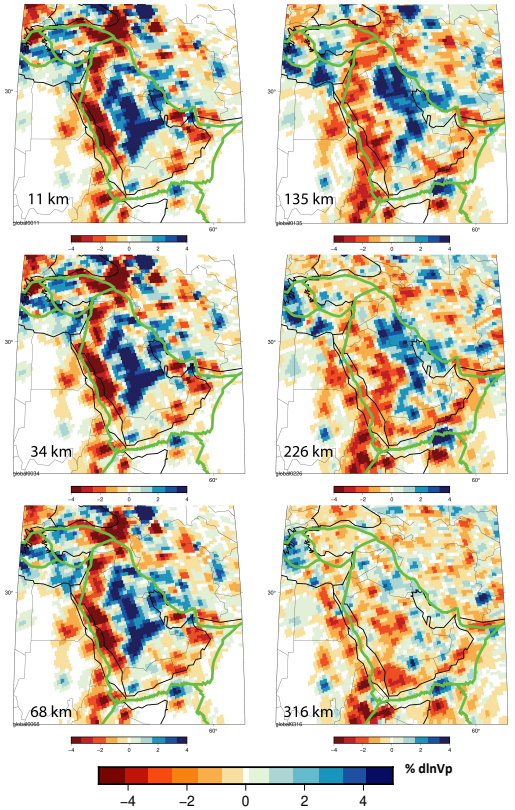
P arrivals picked in a 0.5-2Hz band



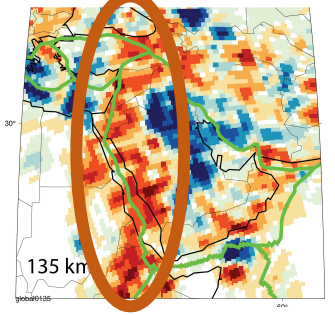
The whole data set illuminates regions not previously covered



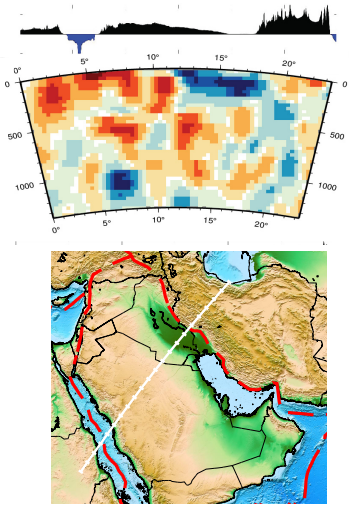
Final dVp/Vp Tomographic Model



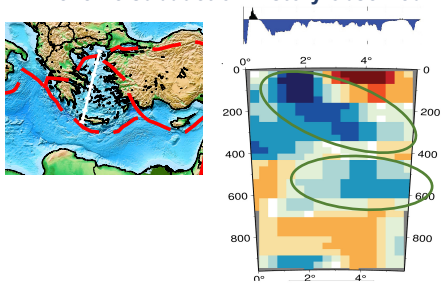
- Low velocity anomaly stretch connecting predicted mantle upwellings



- Underthrust subduction seen at Arabian-Eurasian collision belt



- Hellenic subduction history observed



Conclusions

- Able to better resolve down to upper mantle, beneath Anatolian region, Caucasus, Iranian plateau and middle parts of Arabian peninsula with ISC P arrivals
- Adding waveform P arrival onset measurements from Saudi Geological Survey local networks, provides marked improvement in resolution of crust and mantle under Arabian peninsula.

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