



EAS

NEWS

Shear wave splitting in Saudi Arabia

Obtained Data

The figure to the right shows the distribution of seismic stations deployed by the SAGS. Stations are concentrated along the red sea as there is active volcanism originating from the area.



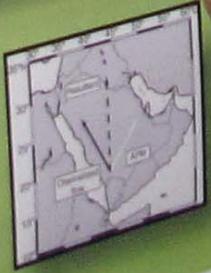
By analyzing results from over 250,000 events, these figures to the left were generated which shows the cumulative direction of shear waves from each station as well as the null results. This shows that a majority of the stations analyzed have a N-S west orientation keeping it consistent with previous studies done on the area.



Average delay time of each station was calculated and plotted on the graph. Although subtle, there is a negative correlation between delay time and the distance away for the Red Sea ridge.



From analyzing data from this project, it has been individually confirmed that the orientation of shear wave splitting does not align with the northeast absolute plate motion. The result suggests that the anisotropy is bounded within the lithosphere and/or the asthenosphere. However, as the lithosphere thickens from east to west along Saudi Arabia, the delay time decreases. This is the opposite of the expected outcome suggesting that the lithosphere is not the source of the anisotropy. Thus, it can be concluded that the anisotropic medium is in the asthenosphere. It has been shown that the orientation of this is from the results of tracking the Afar rift in Saudi Arabia.



References

The figure to the right is obtained from a previous study of the area explaining how a N-S orientated shear wave splitting result may be obtained in contrast to absolute plate motion and plate induced flow.



OUR RESEARCH TELLS A STORY