# Radial anisotropy below a metamorphic core complex, Ruby Mountains, NV

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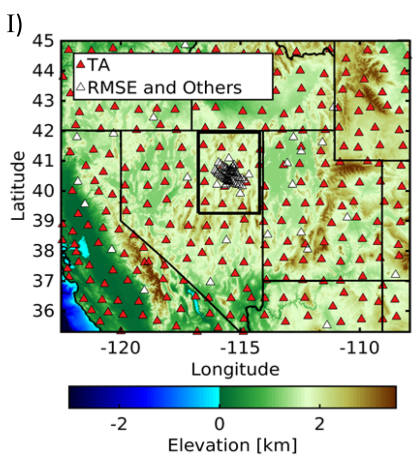
Metamorphic core complexes (MCC) expose deeply exhumed and deformed crustal rocks due to localized extensional deformation. Consequently, their detailed structure can provide a window into deep crustal mechanics. The North American Cordillera contains numerous MCC, one of which is the Ruby Mountain Core Complex (RMCC) located in the Northern Basin and Range. A recent EarthScope Flexible Array seismic deployment, known as the Ruby Mountain Seismic Experiment (RMSE; Litherland and Klemperer, 2017) utilized 50 three-component broadband seismometers between 2010 and 2012. The RMSE combined with Transportable Array (TA) data provides an ideal opportunity for a surface wave investigation of crustal seismic anisotropy due to tectonic deformation. We use data from the RMSE and surrounding networks to obtain surface wave information from cross correlation of ambient noise. The Frequency-Time Analysis (FTAN) method is used to obtain inter-station Rayleigh and Love wave dispersion curves for the RMSE and are combined with regional dispersion curves from a prior surface wave study using TA data (USANT; Ekstrom, 2014). We invert all the inter-station Rayleigh and Love wave measurements for phase velocity maps from periods of 5-40 s. A Markov chain Monte Carlo probabilistic inversion technique is used to estimate radial anisotropy as a function of depth and geographic location. Results show a widespread mid crustal positive ($V_{SH} > V_{SV}$) anisotropic signal throughout most of the study region that is required at 95 % confidence. In contrast, there is an absence of similarly significant lower crustal radial anisotropy across the study area. Interestingly, the volume directly below the RMCC does not strongly deviate from this trend suggesting broadly distributed anisotropy in the deep crust.



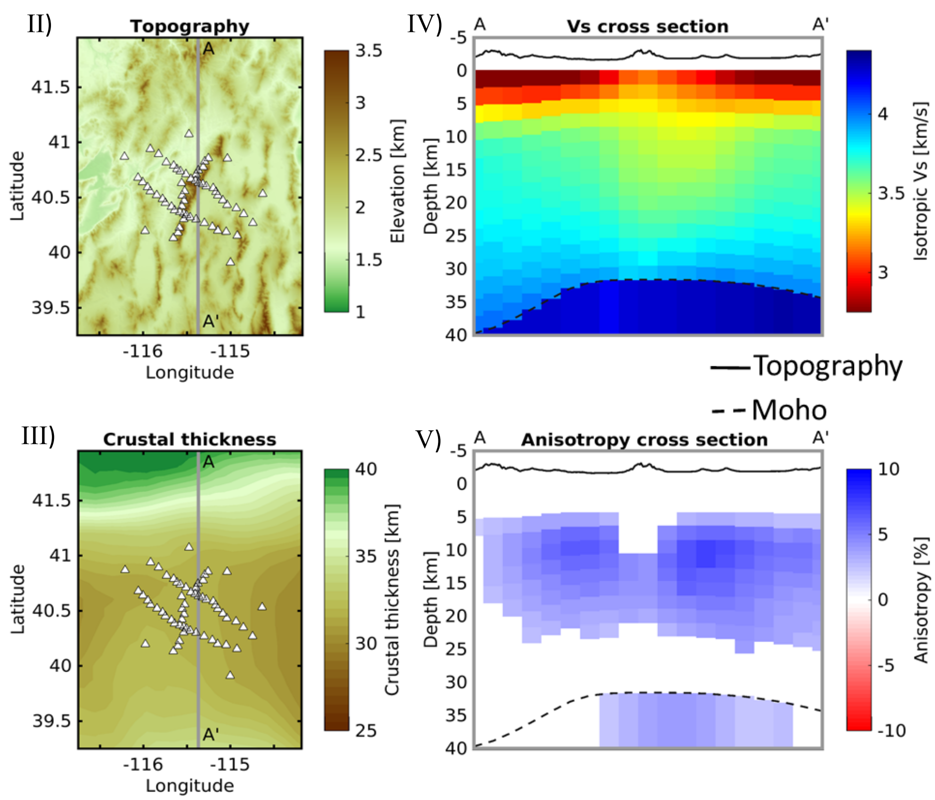




*Figure 1.* I) Regional and II) local topography. Red triangles are TA seismic stations. White triangles are RMSE and surrounding network stations. Gray line shows cross section location. III) Crustal thickness of study region from Schmandt and Lin, (2015). IV) Cross section structure of Isotropic Vs and V) Anisotropy.

## References

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