Summary
- Our attenuation inversion method is based on Liu et al. (2015) using linear triplet of stations
- Application to the dense 3C linear array crossing the San Jacinto Fault in Ramona, CA
  - Fundamental mode Rayleigh and Love wave phases
  - Attenuation tomography maps reveal new information in addition to velocity tomography
  - Shear velocity radial anisotropy and possible shear attenuation anisotropy

Theory: linear triplet of stations & amplitude ratios
- Stationary phase zone
- Forward model: linear triplet of stations and different Q values
- Inversion: take log of amplitude ratios and apply linear regression for Q

Linear Ramona array and San Jacinto Fault (Clark Fault)

Extracting amplitude information from ZZ (vertical) & TT (transverse) components

Rayleigh wave phase velocity and attenuation
- Phase velocity inversion
- Linear least-square with neighboring smoothing
- Attenuation Q⁻¹ inversion
- Linear least-square with neighboring smoothing
- Attenuation Q⁻¹ uncertainty
- Derived from noise cross-correlation amplitude uncertainty

Love wave phase velocity and attenuation

Shear velocity and attenuation tomography from Rayleigh wave
- Shear velocity inversion using MCMC
- Gaussian smoothing filter
- Shear attenuation depth conversion based on inverted shear velocity

Shear velocity and attenuation tomography from Love wave

Conclusion
- We derive reliable amplitude information with uncertainty and improve the linear triplet attenuation inversion approach
- Shear attenuation tomography results are preliminary and they complement the shear velocity tomography results
- Our attenuation tomography results for the Ramona array generally agree with the geological map of regional fault traces for Clark Fault

References