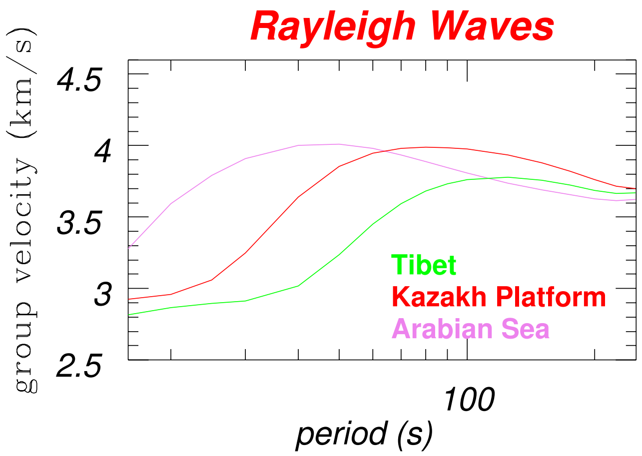
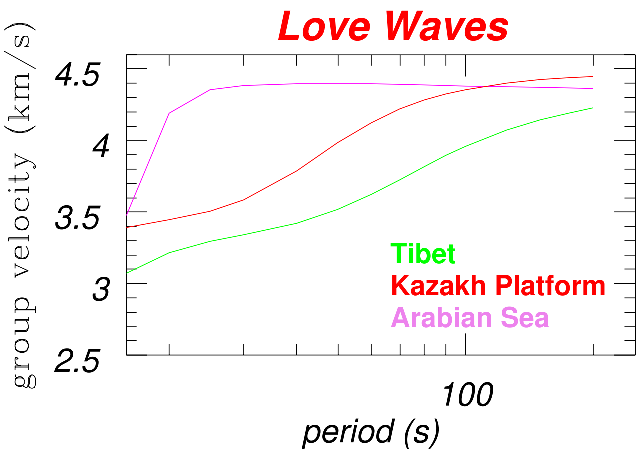
Inversion for vs Model

Data:

Broadband (15s - 250s) Rayleigh and Love wave group velocity maps across Eurasia.
Uncertainties estimated from the cluster analysis.





Procedure:

At a given lat:lon point:

$$\mathbf{m}(r) = (v_s(r), v_p(r), \rho(r))$$

isotropic model

$$U_{R/L}(\omega) = \int_0^R \mathbf{K}_{R/L}(r,\omega) \cdot \mathbf{m}(r) dr$$

group velocity and the model are linearly related

depends on m(r) ⇨ inversion for m(r) is non-linear

Iterative inversion for model perturbations (on iteration i):

$$U^{(i)}_{R/L}(\omega) = U^{(i-1)}_{R/L}(\omega) + \sum_j \left(\frac{\partial U_{R/L}(\omega)}{\partial m_j} \right)^{(i)} \partial m^{(i)}_j$$

can be 'solved' to estimate pert-urbations to each model variable