

## 1-D elastic and anelastic structure of the mantle transition zone beneath Japan obtained from waveform inversion

# Nobuaki Fuji[1]; Kenji Kawai[2]; Robert J. Geller[3]

[1] EPS, Univ. of Tokyo; [2] Earth and Planetary Sci, TITECH; [3] Earth and Planetary Science, Tokyo Univ

The aim of this study is to obtain the inner structure by using body-wave waveform inversion. Utilizing the broadband seismic F-net data (20-200s bandpass filtered), we have estimated the elastic and anelastic structure of the mantle transition zone beneath the Japan. Because we are using singular value decomposition for the data kernel matrix, the truncation of eigenvectors can be a big problem. Our synthetic test shows that elastic perturbation of  $\sim 2.0\%$  can be recovered with relatively small number of eigenvectors, but  $\sim 50\%$  perturbation for anelasticity is hard to detect and we have to take more eigenvectors. We cannot recover the sharp discontinuities (400km discon. up-downs; 510km discon.) which can be expressed as  $\sim 2.0\%$  velocity perturbation with smaller number of eigenvectors and can be expressed as a kink with larger number of eigenvectors. Our results for SH velocity were consistent with previous tomographic works which tells a positive anomaly in the MTZ and in the Pacific West region we found some negative anomaly near 400km discon. As for  $Q_s$  there can be a low  $Q_s$  zone (50-100) but since we ignore the effects of focusing-and-defocusing or the 3-D structure, our results showed the limitation of the low  $Q_s$ . This can constrain the upper limitation of  $dV_s/dT$ .