

## Degree-12 Whole Mantle S Wave Structure Obtained by a New Waveform Inversion Method

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Waveform inversion is recognized as an increasingly important approach which can determine Earth structure with higher resolution and accuracy because it can fully utilize the information included in the seismic waveform data. However it is also recognized that its requirement of huge CPU time and huge inhomogeneity of its dataset are problems. Our research group has developed a 'new waveform inversion method' as a solution to those problems. We developed an accurate and efficient computational method (Direct Solution Method) and an efficient algorithm for waveform inversion and reduced the required CPU time by a factor of about 1/100 (e.g. Geller & Takeuchi 1995, GJI; Geller & Hara 1993, GJI). We also defined an objective index to show homogeneity of dataset and indicated that the obtained model can be improved if we weight data using this index (Takeuchi & Kobayashi 2001, IASPEI).

In this study we apply the above 'new inversion method' to the actual data and invert for whole mantle degree-12 S wave structure. We show that our method is effective by comparing the obtained model by inversions with and without our weighting method(See the attached figure). Also, we plan to show the meaning of our data weighting by comparing the resolution and covariance matrices for these two models.

