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Analysis of Seismic Waves by Independent Component Analysis

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Independent Component Analysis (ICA) is one method for estimate statically independent signals from mixed signals that are linear, and has advantage when decomposes mixed signal compared to Principal Component Analysis (PCA) that is similar static.

As applications of ICA, there are examples of analysis of image, brain waves, and audio. Blind source separation (BSS) is especially known in audio area. As field of geophysics, separation of train noise and seismic electric signals (Koganezawa, 2001) applies ICA to electric signals.

However, there is not much examples that applies ICA to seismic wave.

We have examined the ICAs coverage areas when seismic wave and sensor or environmental noises are mixed. This presentation discusses the scope of application of ICA using a model that has some earthquakes within one observed data. Next, we try to separate some earthquakes using actual strong seismic data.

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