VARIABLE NORM DECONVOLUTION

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Abstract

Seismic observations are commonly modeled by the convolution of a source wavelet with the earth's reflectivity series. Deconvolution is a signal processing operation which attempts to estimate the reflectivity series from recorded seismograms. These reflectivity series convey information about the physical properties of the earth essential to petroleum exploration and the study of earthquakes.

Variable norm deconvolution is a multichannel technique which iteratively estimates an inverse to the source wavelet which when convolved with the recorded seismogram yields the reflectivity series. This inverse is estimated such that the resulting reflectivity series is as spiky and non-Gaussian as possible.

The proposed method is derived from statistical theory and implemented using several non-linear optimization techniques. It differs from conventional methods because it requires no assumptions restricting the phase of the source wavelet or color of the reflectivity series. Results obtained using synthetic and actual seismograms are comparable, and in some cases superior, to those obtained using conventional methods.

This
Thesis
Is
Dedicated
To
My
Wife
And
Children

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