

Enhancement of Cepstral Methods for the Improved Processing of Seismic Data

In this paper, we discuss research in improving shallow depth estimates by adding enhancements to our Cepstral processing. These enhancements include: 1) the employment of a predictive lifter to the Complex Cepstrum, which should improve the depth phase removal; thereby, giving a better estimate of the P-phase; 2) the effectiveness of the lifter in removing a second explosion from the seismogram; 3) The use of Mel Cepstrum (taken from speech literature) for discriminating events of interest (explosions versus earthquakes); 4) the identification of ripple fire events as a screening tool for reducing the analysts' work load by quickly identifying ripple fire mining explosions. Finally, we investigate Complex Cepstrum methods to improve very shallow event depth estimates, including pre-filtering, use of single station data versus array data, for identifying multiple explosions, and weighting of the time series (seismogram); thereby, taking advantage of minimum/maximum phase sequences.

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