

WAVELET COMPRESSION OF SEISMIC DATA ¹

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While wavelet transforms have been used in the analysis of seismic signals [1], the methods used for the compression of seismic signals have been limited to Linear Predictive Coding (LPC) and Transform Coding [2]. In this paper, we use wavelet-based transforms in the transform stage of the compression algorithm. The wavelets evaluated are compactly supported, and are either orthogonal or biorthogonal.

Performance will be judged by examining the corresponding rate-distortion curves, as well as the loss of scientific information. We will show the improved performance obtained by allowing for arbitrary tree-structured decompositions over that obtained by the successive decomposition of the low frequency subband. We will show that wavelet transforms are well suited for seismic data compression, and comparisons with the discrete cosine transform will be provided .

[1] Goupillaud P., Grossman A. and Morlet J., "Cycle-octave and Related Transforms in Seismic Signal Analysis," *Geoexploration*, Vol. 23, No. 1, pp. 85-102, 1984

[2] Spanias A. S., Jonsson S. B. and Stearns S. D., "Transform Methods for Seismic Data Compression," *IEEE Transactions on Geoscience and Remote Sensing*, Vol. 29, No. 3, pp. 407-416, May 1991

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