

ELIMINATION OF SURFACE-RELATED MULTIPLES: A WAVE-THEORY BASED SOLUTION (2-34)

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Seismic data suffers from multiple reflections that should preferably be eliminated before further processing (migration etc.). Several multiple elimination techniques based on wave theory have already been developed for suppressing water layer multiples and water layer reverberations in marine data. For these techniques the position and shape of the sea bottom must be known. In this paper a new method is discussed for eliminating all surface-related multiples from marine data as well as land data. It does not require any knowledge about the subsurface structure. This method is directly based on wave theory. Its main characteristic is that the pre-stack data itself is used as a multiple prediction operator. No other information is required for this elimination scheme, except for the source properties and the surface P-P reflectivity. Therefore any subsurface structure can be handled. The procedure is applied in the space-frequency domain and mainly consists of 'generalized Kirchhoff summation-like' operations. Therefore the algorithm vectorizes very well making it suitable for vector machines. The method is illustrated by some acoustic and full elastic synthetic data examples.

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