

COMPUTATION OF INSTANTANEOUS PARAMETERS OF SEISMIC SIGNAL
WITH APPLICATIONS TO BLACK SEA AND MEDITERRANEAN DATA

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Les parametres de frequence, de phase et d'amplitude instantanée du signal sismique sont calculées d'après transformation d'Hilbert durant les differentes sequence du traitement de l'information sismique. La technique de l'analyse numerique est elaborée avec la presentation et la discussion des resultats de l'application sur les données sismique de la Mer Noire, et de la Mediterranée.

Hilbert transformation makes it possible to determine the imaginary part of a system function, from the given real part of the function or vice versa. The recorded seismic trace is assumed as the real part of a complex signal. And by applying quadrature filter through Hilbert transformation, the imaginary part i.e the quadrature component is computed (Clearbout, 1976). Then it becomes very easy to compute the instantaneous amplitude, in other words, envelope function by computing the amplitude of the time dependent phasor. The phase of the phasor is the instantaneous phase and time derivative of the instantaneous phase gives the instantaneous frequency.

Displays of these instantaneous parameters bring some facilities for the interpretation. The instantaneous amplitude is a measure of reflectivity strength, the instantaneous phase is a measure of continuity of the events, and instantaneous frequency is a useful tool for "character" definition of seismic traces (Ö.Yılmaz, 1978).

In order to prevent any misinterpretation, during the applications of this technique to the seismic data, care must be taken to preserve amplitude and frequency content of the seismic signal. The random noise and multiples must be removed, the events must be migrated to their true geological positions (Taner, et al 1977).

In this study for computation, the algorithm given by Ö. YILMAZ, was used. The software originally prepared for COMMAND were developed for TEMPUS system, and applied to the seismic sections by K. AYTUN, so the speed of the processing was increased tremendously by using the AP-120B.

The instantaneous measurements were demonstrated by applying them to Black Sea, Mediterranean seismic sections mostly were processed by N. GÜLÜNAY.

This study was supervised by T.D. ÖZÇANDARLI (The Director of Data Processing Center).

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