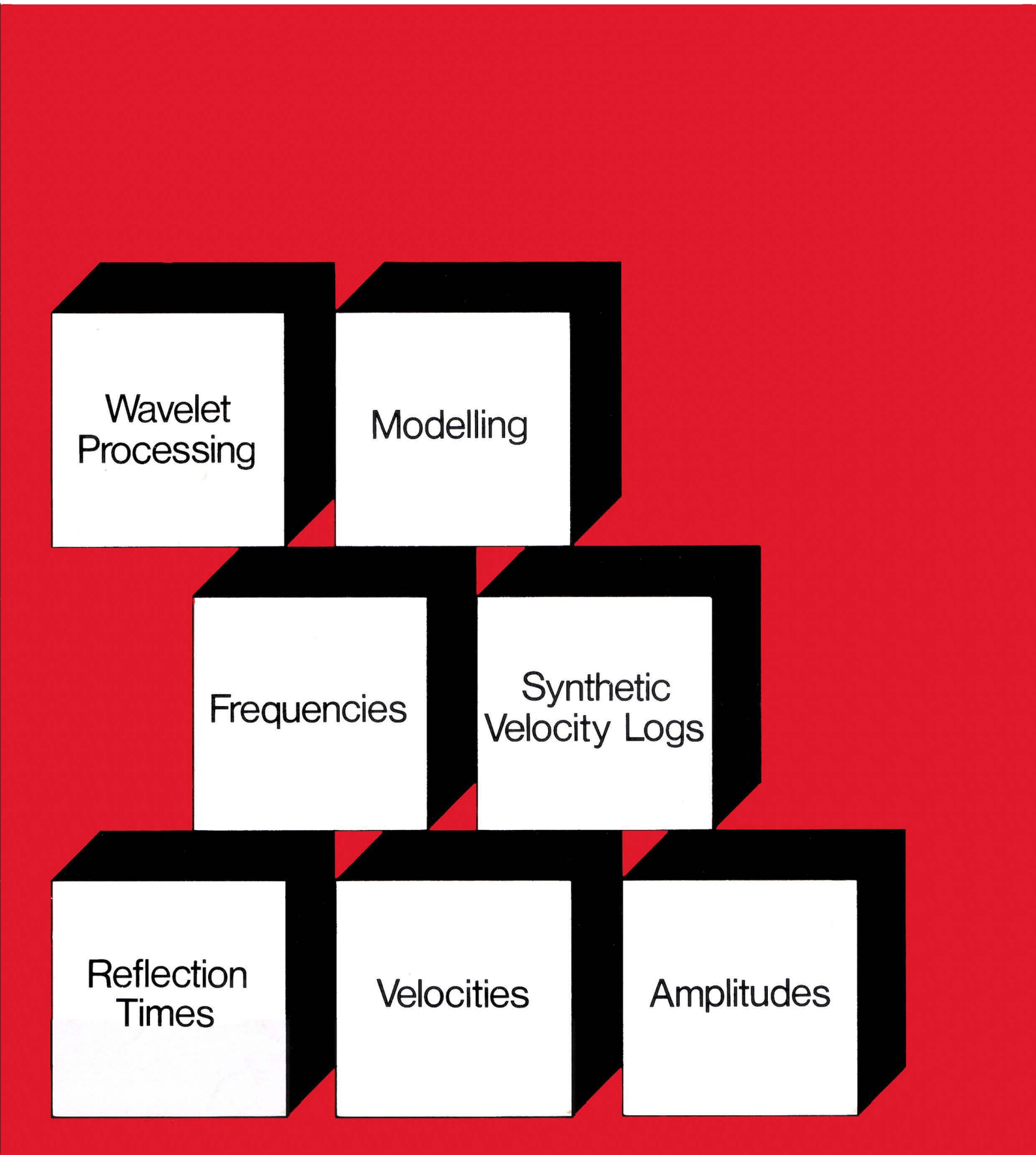
PRAKLA-SEISMOS INFORMATION No.17

Seismic Modules for Lithological Studies



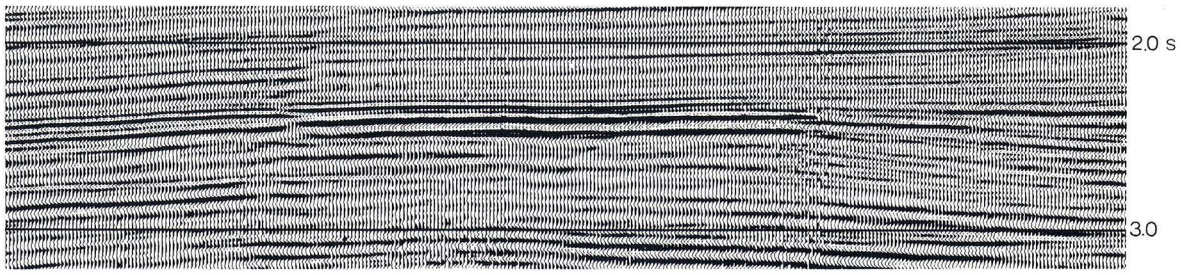
Seismic Modules for Lithological Studies

The following seismic parameters can be determined from seismic surveys by means of modern data processing

- Reflection times
- Velocities
- Amplitudes
- Frequencies

These parameters are indispensable for lithological studies. For the determination of these parameters PRAKLA-SEISMOS offers proved program systems, which master the need to achieve detailed studies as well as general studies. The former is realized by means of presentation in section form, the latter by means of presentation in map form, carried out by automatic contouring.

Reflection-Times:

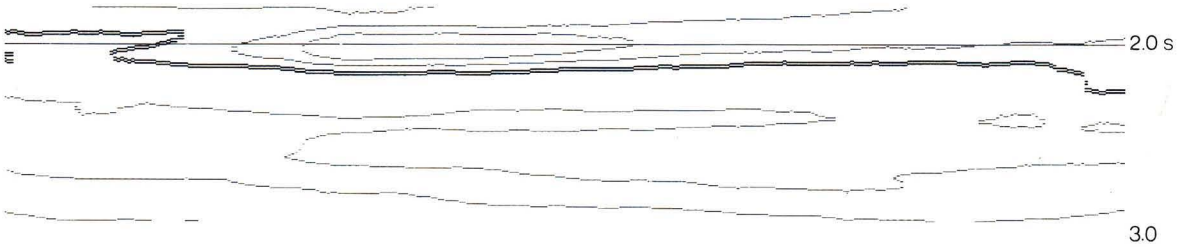


Line X: 24 fold stack

- Stacking-Velocities
- RMS-Velocities
- Interval-Velocities

(for details see PRAKLA-SEISMOS Information No. 14, Velocity Analysis)

Velocities:

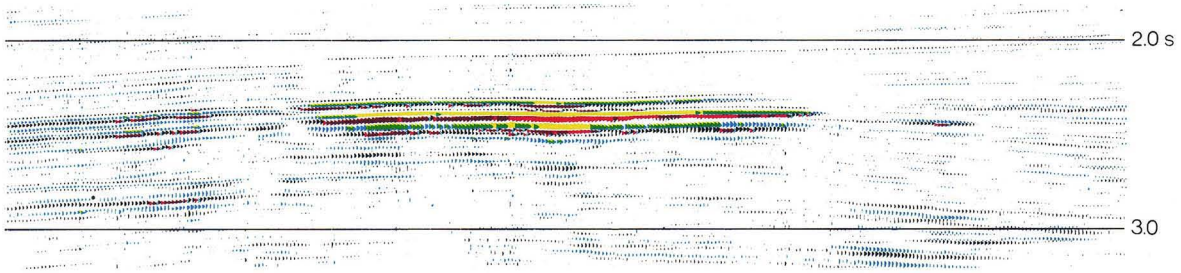


Line X: Stacking Velocities

- Amplitude Studies
- Polarity Studies

(for details see PRAKLA-SEISMOS Information No. 10, Real Amplitude Processing)

Amplitudes:

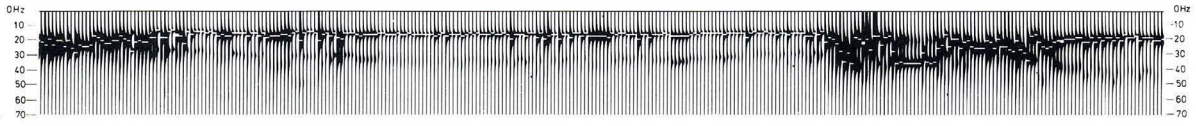


Line X: Real Amplitudes

- Frequency Analysis
- Absorption Studies

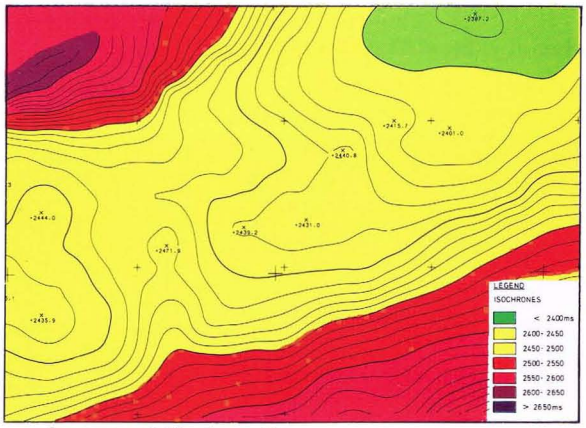
(for details see PRAKLA-SEISMOS Information No. 7, Frequency Analysis)

Frequencies:

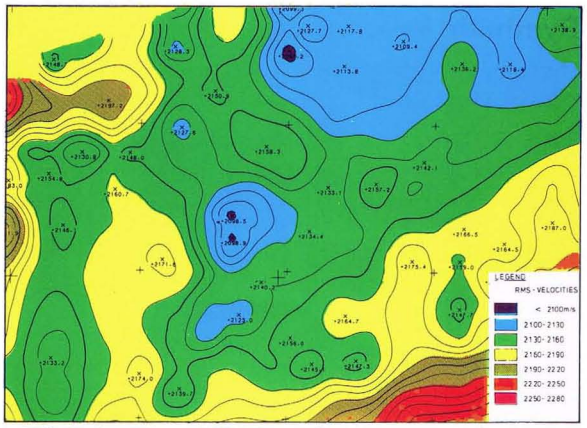


Line X: Power Spectra of Horizon C

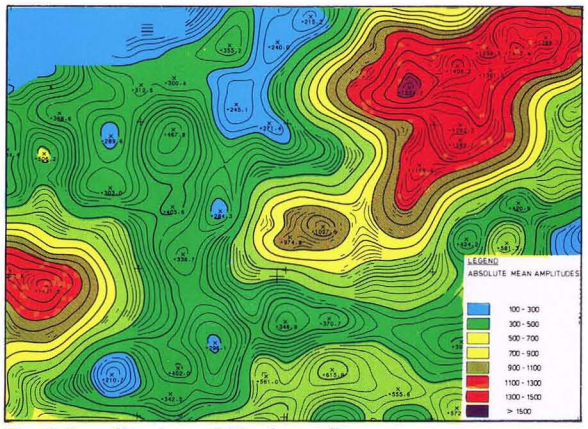
Contouring Program



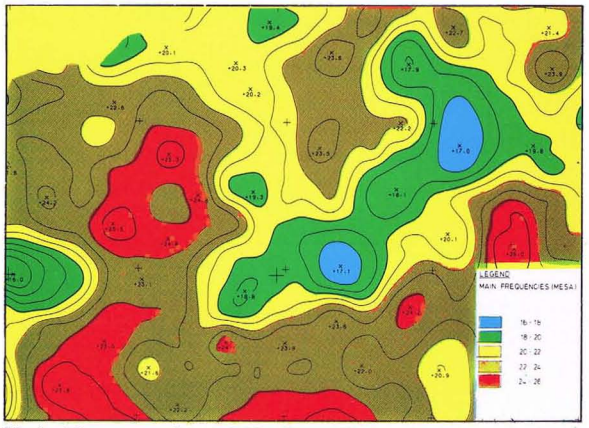
chrones of Horizon C



MS-Velocities of Horizon C



Real Amplitudes of Horizon C



Main Frequencies of Horizon C

For further lithological studies PRAKLA-SEISMOS offers the following special processing:

Wavelet Processing

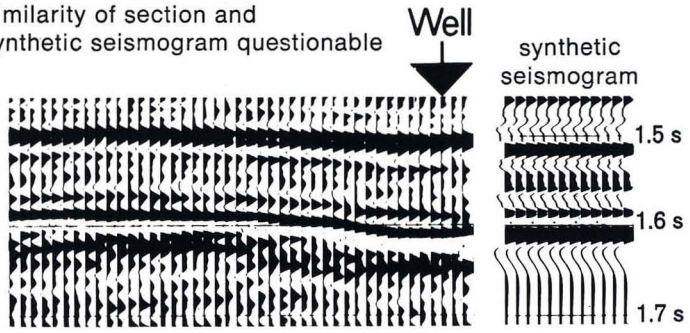
This method takes into account the actual wavelet contained in the seismic field trace. Thus, the following can be achieved:

- Better attenutation of muliples
- Better resolution
- Improved similarity of processed section and synthetic seismogram

(for details see PRAKLA-SEISMOS Information No. 8, Wavelet Processing)

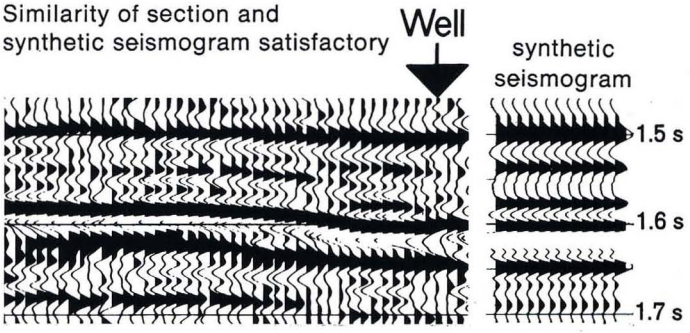
Result without Wavelet Procesing

Similarity of section and synthetic seismogram questionable



Result with Wavelet Processing

Similarity of section and synthetic seismogram satisfactory

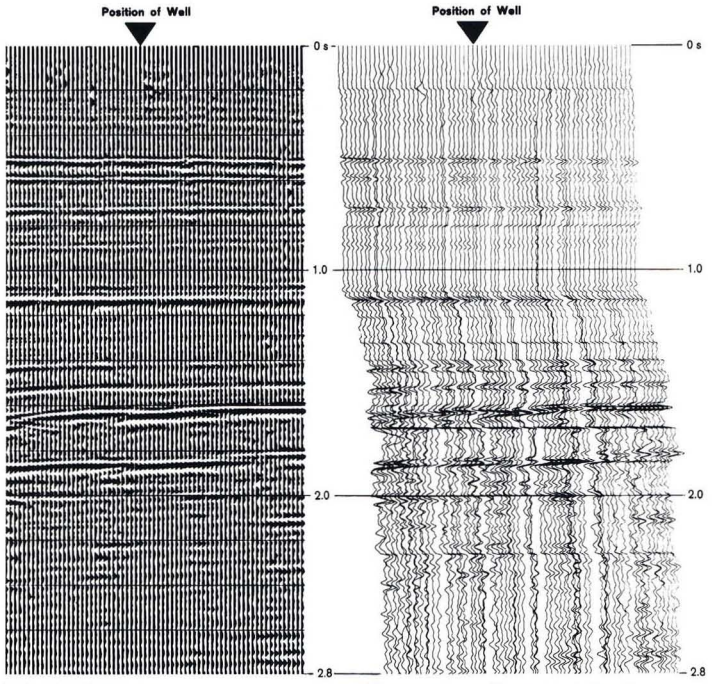


Synthetic Velocity Logs

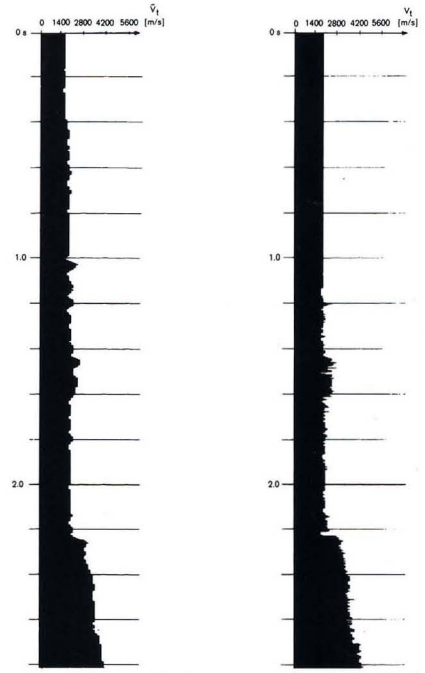
The aim of this method is to produce synthetic velocity logs or impedance logs from surveyed seismic traces.

Here, the surveyed seismic trace yields, after elimination of disturbing factors such as noise, wavelets, multiples and absorption, the high-frequent parts of the resulting log, whereas the low-frequent parts must be derived from stacking velocities.

(for details see PRAKLA-SEISMOS Information No. 5, Synthetic Velocity Logs)



Stacked Traces **Corresponding Synthetic Velocity Logs**



Synthetic Velocity Log at Well **Actual Well Velocity Log**

Modelling

Lithological studies are not always sufficient using seismic parameters derived from surveyed data. In addition the operation, in reverse, via modelling presents the opportunity of approximating hypothetical geological and geophysical data and survey-results by trial and error. Here the aid of PRAKLA-SEISMOS' **Interactive System** can be offered.

(for details see PRAKLA-SEISMOS Information No. 16, Modelling)

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