

Motivation

From source to receiver...

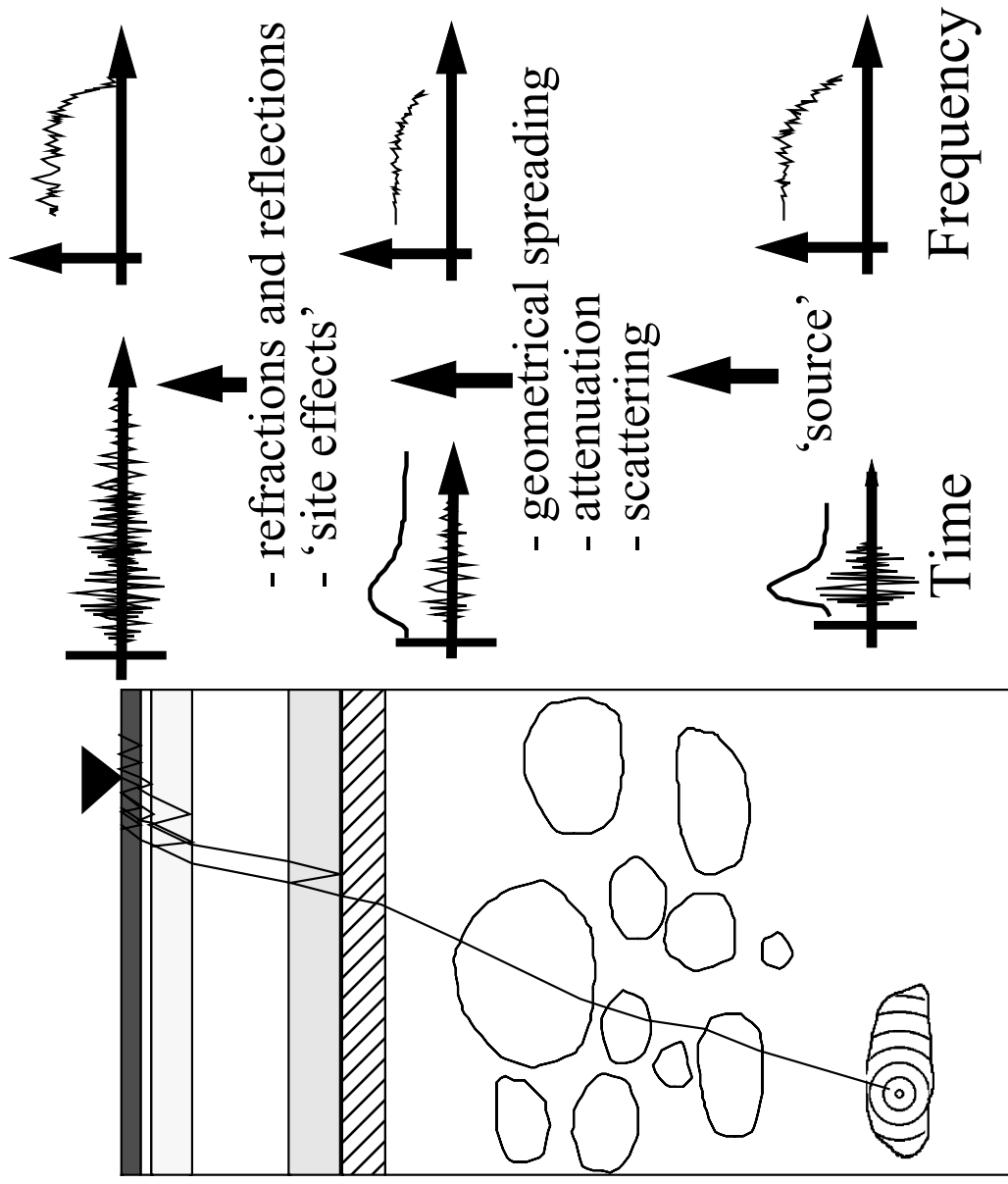


Fig. 1.1 Signal distortion during wave propagation from the earthquake source to the surface.

Influence of recording system

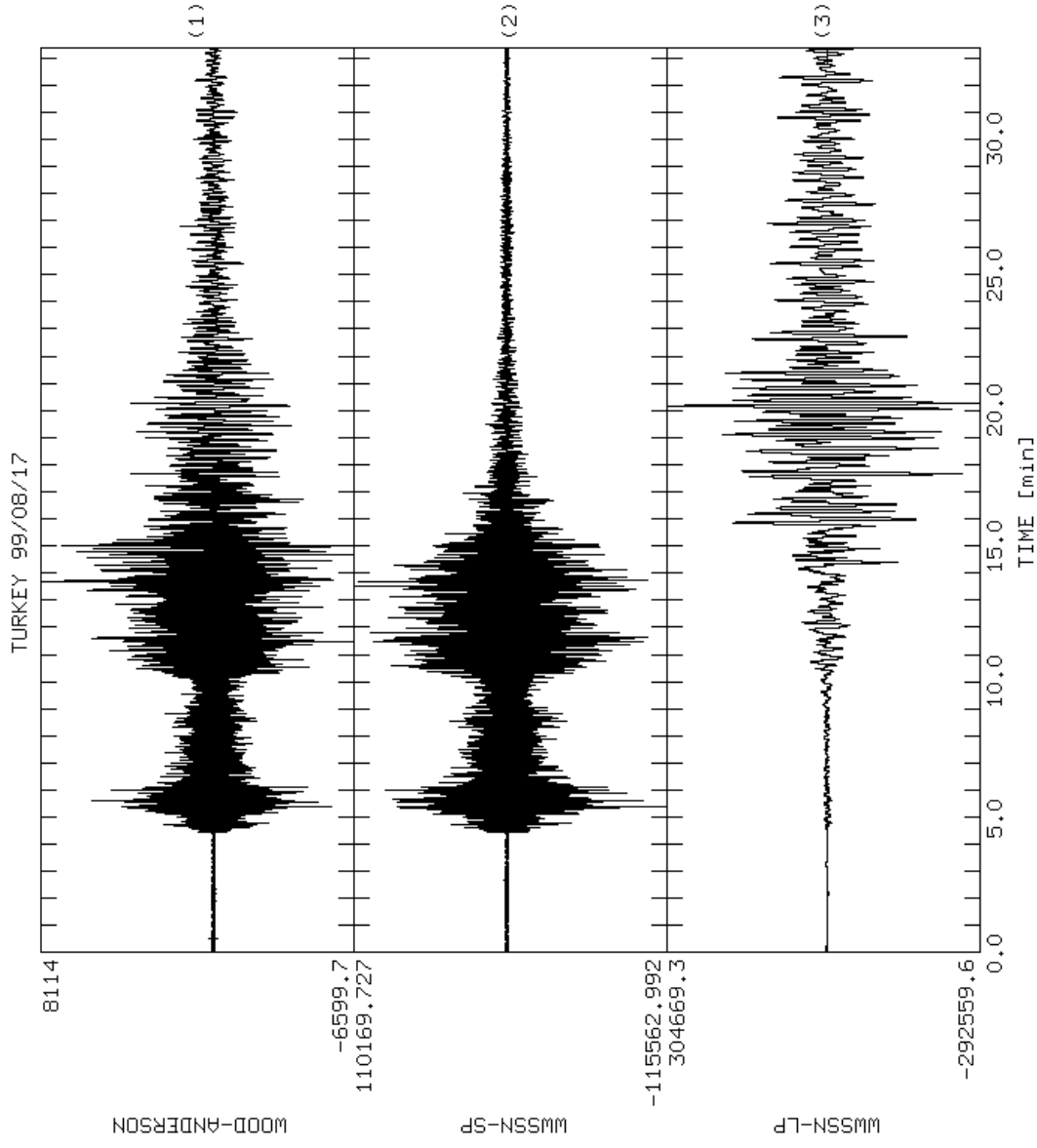


Fig. 1.2 Vertical component record of the Izmit earthquake in Turkey (1999/08/17) recorded at station MA13 of the University of Potsdam during a field experiment in Northern Norway. Shown from top to bottom are the vertical component records for a: Wood-Anderson, a WSSN SP, and a WSSN LP instrument simulation.

Sampling process

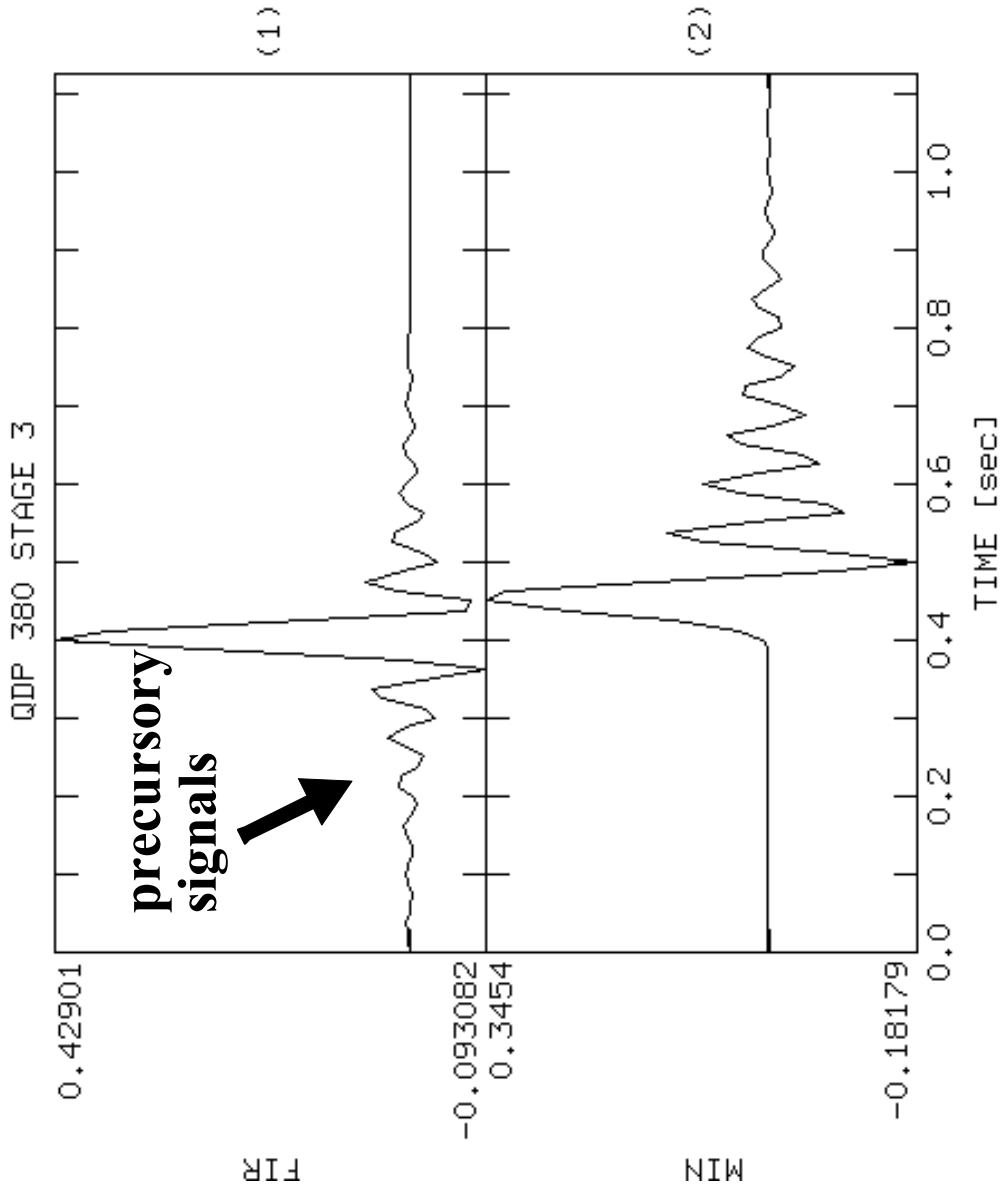


Fig. 1.3 Impulse response of stage 3 of the two-sided decimation filter incorporated in the Quanterra QDP 380 system (top trace). The bottom trace shows a filter response with an identical amplitude but different phase response.

Frequency response

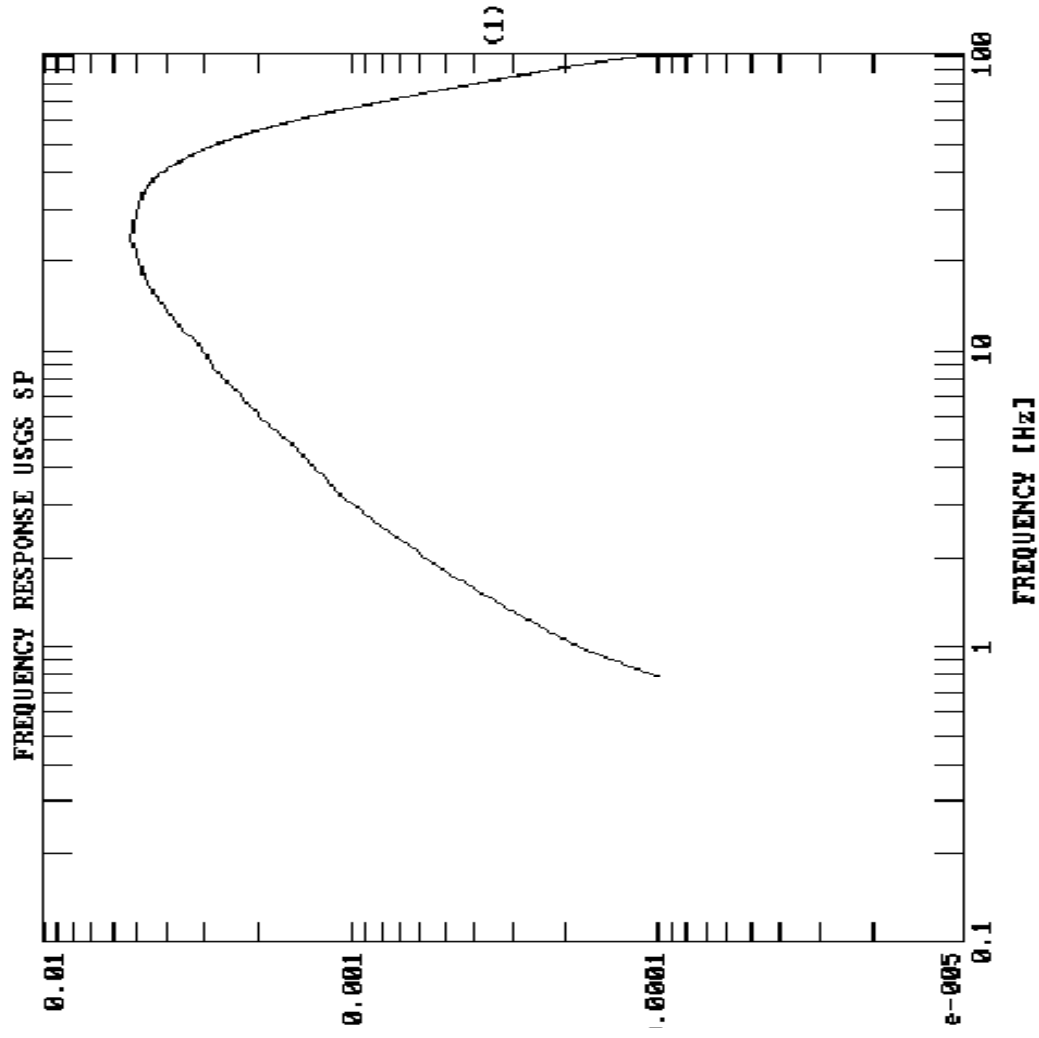


Fig. 1.6 The theoretical frequency response function (modulus) for the USGS short-period refraction system (normalized response to ground displacement). After Luzitano (1988).

Displacement record

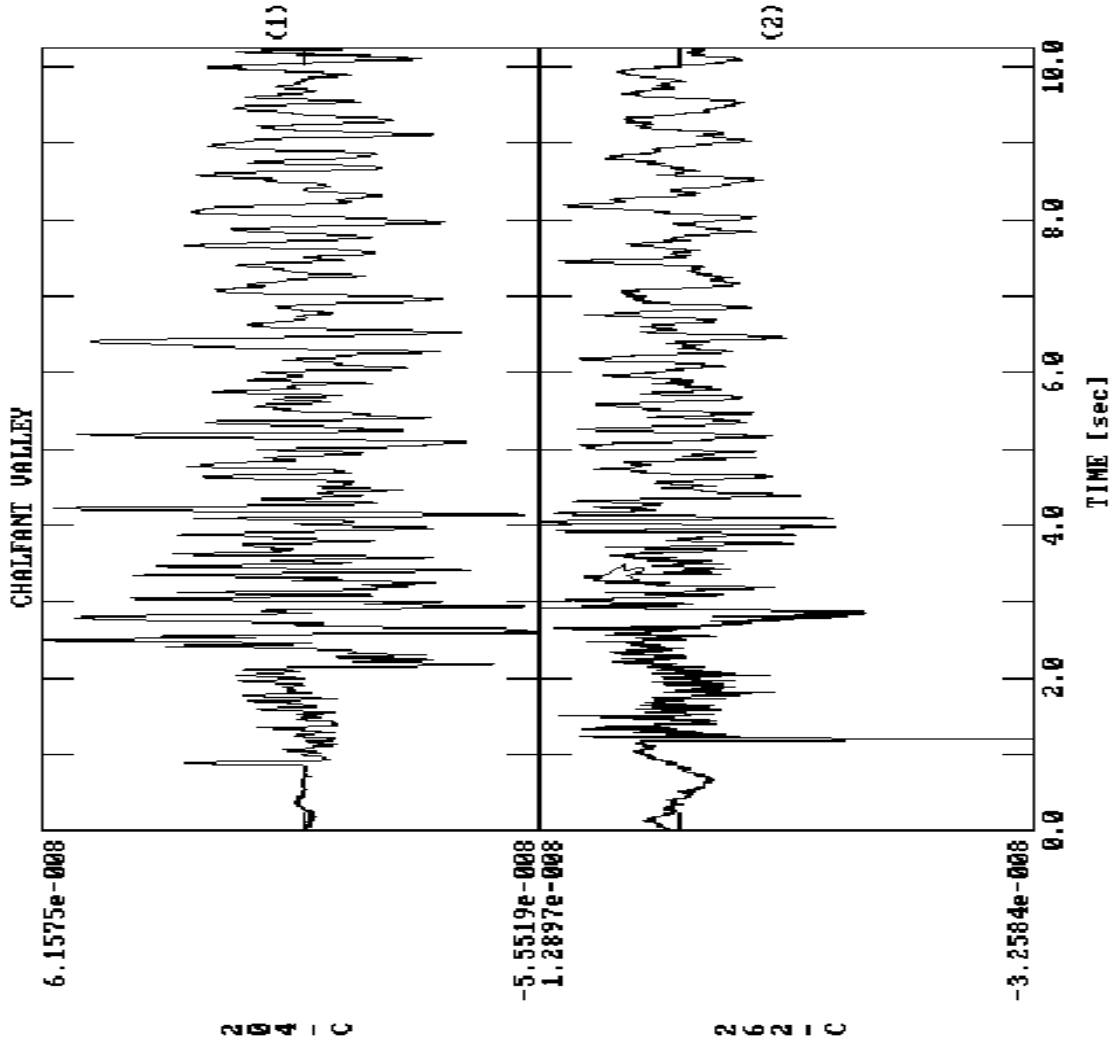


Fig. 1.7 Instrument corrected displacement records of the signals shown in Fig. 1.5.

Displacement spectrum

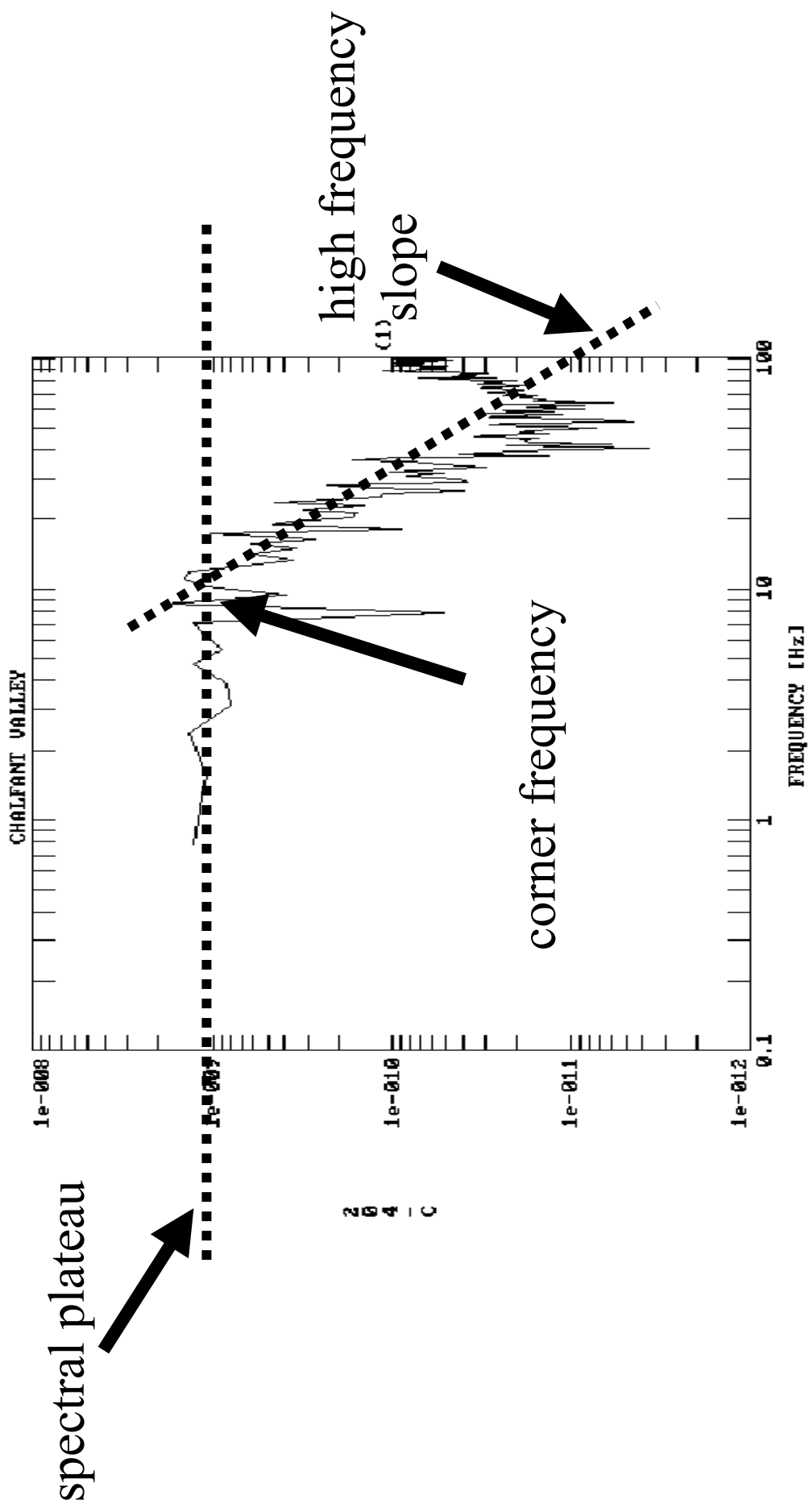


Fig. 1.8 Displacement spectrum for the P- wave portion of the instrument corrected displacement record of station 204 (top trace in Fig. 1.7).

Signal parameters

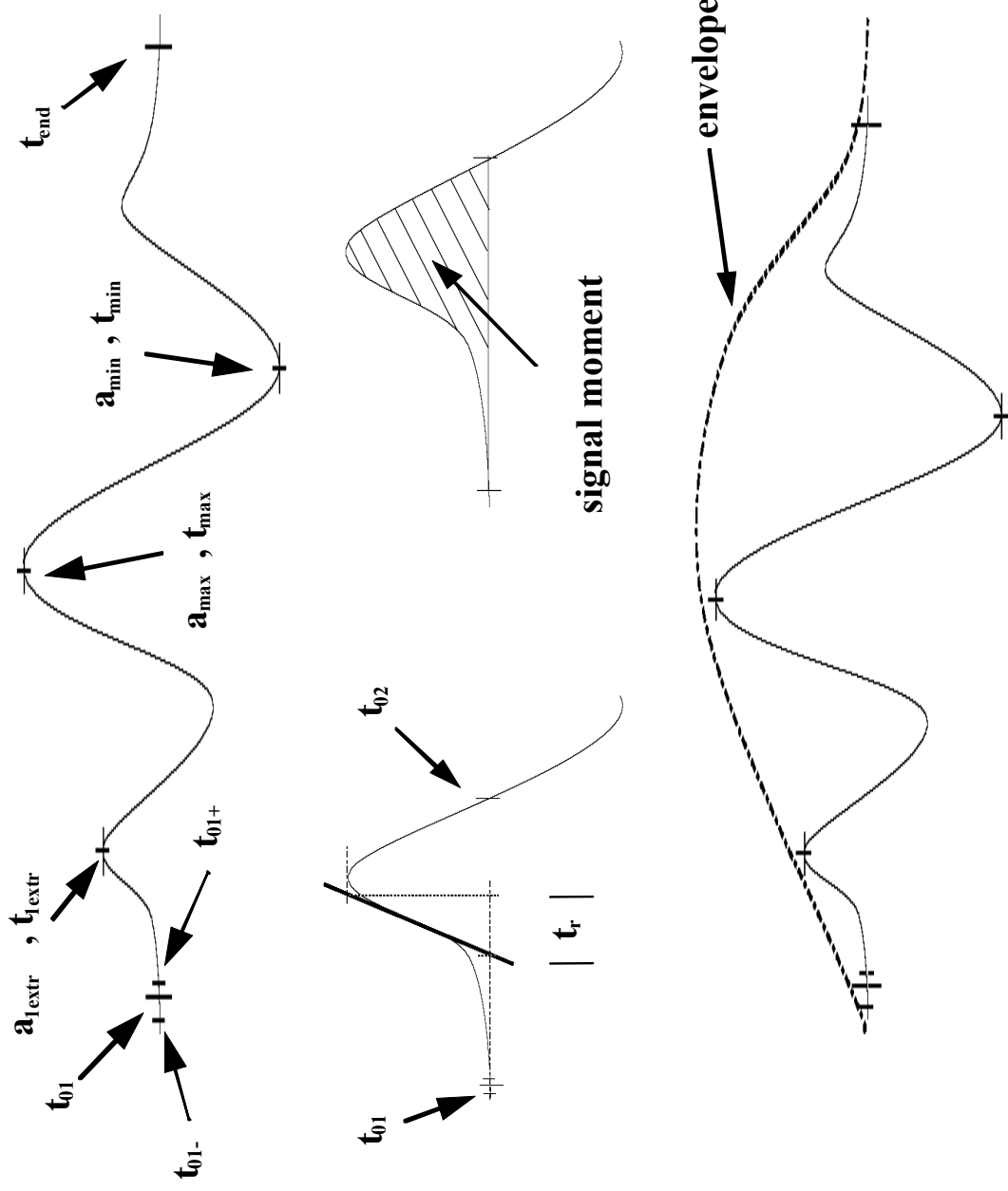


Fig. 1.9 Commonly determined signal parameters such as onset times and amplitudes, rise time, signal moment or envelope parameters.

Definition

- **Filters** or **systems** are, in the most general sense, devices (in the physical world) or algorithms (in the mathematical world) which act on some **input signal** to produce a - possibly different - **output signal**.

Seismogram

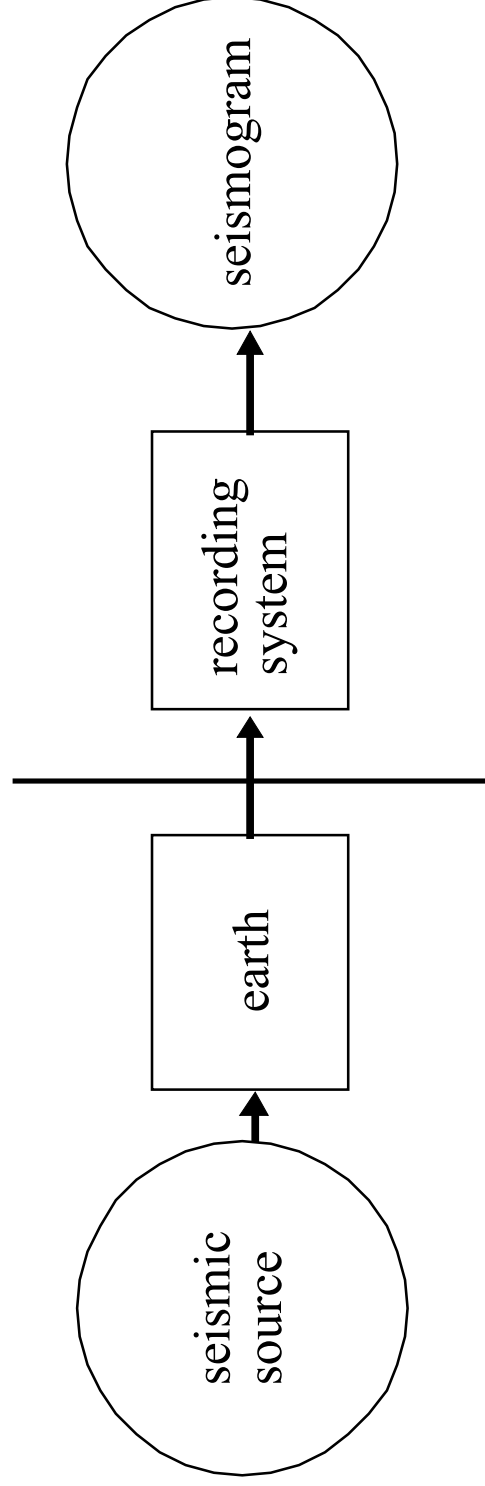


Fig. 1.11 System diagram of a seismogram