

SEISMIC SURFACE WAVE - MASW

The MASW method (Multiple Analysis of Surface Waves) consists in the study of surface wave propagation in the underground, to deduce variations in shear wave velocities (Vs) under the acquisition profile. Obtained velocities are used in calculations of soil-structure interaction under seismic activity (earthquake, vibration). Surface waves are generally used to characterise geological formations (fracturing, splitting, alteration) and to detect voids or deconsolidations.

The operational investigation depth for this method is about 15m. Under certain conditions, it is possible to go deeper, but definition will be lower.

The illustration below represents broadly a MASW data acquisition: a seismic source (weight-drop) generates surface waves. These are recorded by a profile of sensors (12, 24 or 48 sensors) connected to a seismic recorder. Seismic source, sensor spacing and sensor-source spacing all depend on the depth needed to be reached.



Figure 1: Illustration of a MASW data acquisition

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The MASW method consists of several stages: data acquisition, creation of curves of dispersion, and reversal of dispersion curves to determine the vertical seismic profile Vs (Park et al., 1997). The following figures illustrate the different MASW processing stages. Shear wave velocity is sensitive to the mechanical state of the subsoil.







Table 2b: The different MASW stages

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