



Seismic surface-wave interferometry using cross-correlation and deconvolution methods

Adnand Bitri, Kévin Samyn, and Gilles Grandjean

BRGM, Natural Risks and CO2 Storage Security Division, Orléans, France (a.bitri@brgm.fr, (+33) 02.38.64.37.38)

Frequency analysis of surface waves propagation is an efficient tool to retrieve the vertical shear-wave velocity (V_s) profile. Resulting from the interaction of elastic waves with a free surface, surface waves are commonly generated by impulsive active sources but can also be obtained by ambient noise data processing. In this paper we compare the results of interferometric estimation of the dispersion of surface-wave from a controlled noise source and by using both cross-correlation and deconvolution processing methods. The key step in the surface wave analysis is the generation of dispersion images and extraction of reliable dispersion curves, since they are used to obtain shear-waves velocity profiles through inversion process. In this study we show that the dispersion character of surface waves is better defined when using deconvolution method. Dispersion diagram of deconvolution results shows strong energy plots referring not only to the fundamental propagation mode but also to the first higher ones, providing a great advantage compared to the classical processing techniques. This is probably due to the independence of deconvolution processes with the source function.