



Role of SH Wave in the Mapping of Shallow Subsurface

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Abstract

SH waves are directly related to soil matrix which makes SH wave refraction/reflection methods effective in site investigation. This paper presents the generation of purely SH wave by using a specially designed SH wave source, this generator plate is made of aluminum metals and the wave is generated by giving impact on the generator plate in the horizontal direction, and it has nails on its base which keeps it fixed to the ground so that only horizontal motion is recorded. Since the SH wave propagates in a plane transverse to the ray path, this SH wave generator is kept fixed in a direction perpendicular to the geophone spread. The seismic waves have been recorded using geophones with a natural frequency of 10 Hz and 4.5 Hz. The propagation of SH waves in shallow subsurface can be modeled by the finite difference (FD) method based on a staggered algorithm. The developed software for FD modeling of the medium has been tested for SH wave propagation in a purely elastic medium in terms of numerical stability, dispersion, and boundary conditions. The obtained near-surface properties have been used as an input in the FD method to simulate SH waves and to compare with the real data records acquired in the region surrounding North Almora Thrust (NAT).

Keywords: Finite difference modeling, MASW, Ground motion simulation