Can1

Purpose

Assess the precision of modeling in a halfspace with $V_P/V_S = 7.5$.

Coordinate System

Right-handed Cartesian, x positive North, y positive East, z positive downward, all coordinates in meters.

Grid

Grid spacing = 10 m
Minimum vertical size of the model = 3000 m

Material Properties

Homogeneous halfspace

v_p [m/s]	v_s [m/s]	density [kg/m^3]	Q_p	Q_s
1500	200	2100	Inf.	Inf.

Tab. 1 Material parameters

Source

Point double-couple.
Strike 22.5˚, Dip 90.0˚, Rake 0.0˚ ($\Phi_S = 22.5°$, $\delta = 90°$, $\lambda = 0°$)
$M_0 = 10^{18}\,\mathrm{Nm}$.

Moment time history is $\exp\left\{-\left[\omega(t-t_S)/\gamma\right]^2\right\}\cos\left[\omega(t-t_S)+\vartheta\right]$,

where $\omega = 2\pi f_P$, $f_P = 1.5$, $\gamma = 2$, $\vartheta = \pi/2$, $t_S = 1$.
Source depth = 25 m. Taking the epicenter as the origin of the coordinate system, the source is at (0, 0, 25).

Receivers

- one surface profile in the direction of the grid line/Cartesian axis x; receiver spacing is 500 m
- one surface profile in the direction of the grid/Cartesian xy-plane diagonal; receiver spacing is 500.63 m
- maximum epicentral distance: 5 km

- one vertical profile at distance of 1000 m from epicenter along the x-axis; the profile spans the free surface and the bottom of the grid; receiver spacing is 50 m
- one vertical profile at grid point (708,708,0) on the xy-plane diagonal; the profile spans the free surface and the bottom of the grid; receiver spacing is 50 m

The receiver positions are specified in the file rec_coordinates_for_Can1.txt

Time Window

Time window for all receivers is 0 – 30 s.

Frequency Range

The computation should be accurate enough up to 4 Hz.

Output Information

Time histories of particle velocities (in meters/sec) for all receivers.
Required time step is 0.05 s.
To ensure uniformity in any comparison, do not apply any additional filtering to time series apart from the specified source function.

Reference Solution

DWN (Axitra).