Model 2 (shallow seismics)
Homogeneous layer over homogeneous halfspace

Coordinate System

Left handed cartesian coordinate system (see Fig. 1).
All vector components point into the direction of the corresponding coordinate axis. (For example a positive force acts downwards and vertical velocity seismograms are positive for downward movement.)
All coordinates are in meters.
The free surface coincides with the plane z=0.

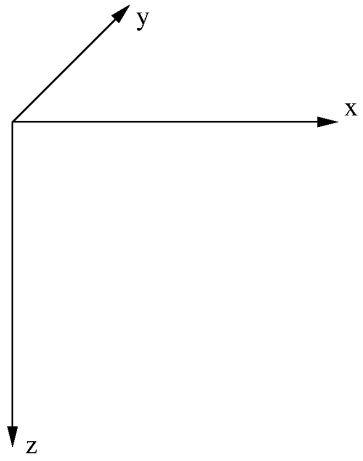

Figure 1: Used coordinate system.

Material Properties

Homogeneous elastic layer (5 m thick) over homogeneous elastic halfspace. The material parameters are given in Tab. 1.

	v_p in m/s	v_s in m/s	density in kg/m^3	Q_p	Q_s
layer (5 m)	500	300	1800	inf	inf
halfspace	1200	700	2000	inf	inf

Table 1: Material parameters.

Source

Vertical point force with the force time function:

$$s(t) = \begin{cases} 0 & \text{for } t \leq Ts, \\ F_0 \sin^3\left(\frac{\pi(t-Ts)}{Td}\right) & \text{for } Ts < t < Ts + Td, \\ 0 & \text{for } t \geq Ts + Td. \end{cases}$$

with the following parameters used for the modellings:
Ts=0 s (time of source onset)

Td=32 ms (duration of source signal)
F_0=1 N (scalar force)

The used source time function (without including the factor F_0) and the corresponding amplitude spectrum are plotted in Fig. 2.

The source is located at the origin of the coordinate system.

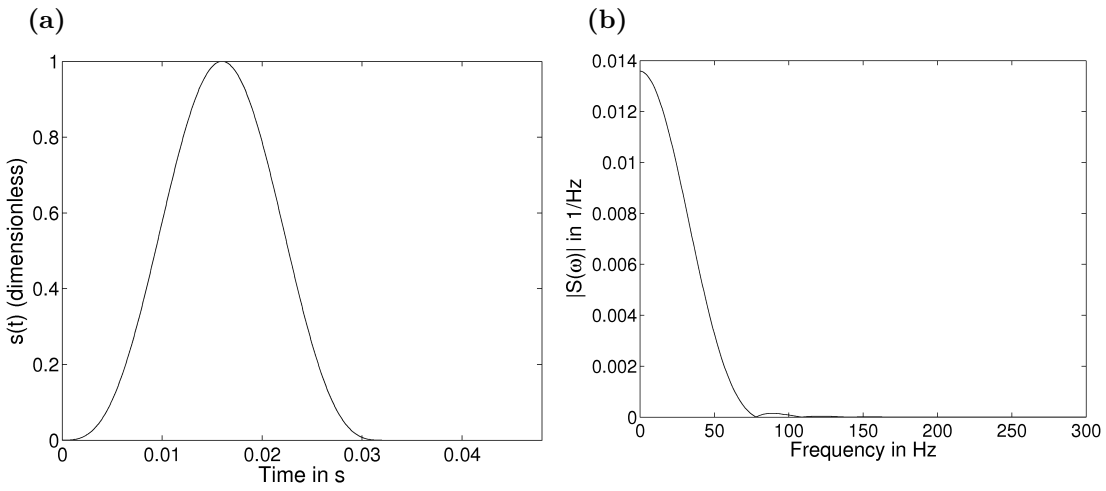

Figure 2: Force time function used for the modellings. In (a) the wavelet is plotted in the time domain and in (b) the corresponding amplitude spectrum is shown.

Receivers
24 equidistant receivers with a minimum offset (source receiver distance) of 1 m and a maximum offset of 70 m. The receiver distance is 3 m. The receivers are located at the free surface.

The explicit coordinates are given in Tab. 2.

Time Window
Time window for all receivers is 0 s to 0.6995 s.

Frequency Range
The modellings should be accurate for the whole frequency range given by the source time function.

Output Information
Time histories of particle velocities for x, y and z component (in m/s) for all receivers.

Required time step is 0.5 ms.

No.	x in m	y in m	z in m	No.	x in m	y in m	z in m
1	1	0	0	13	37	0	0
2	4	0	0	14	40	0	0
3	7	0	0	15	43	0	0
4	10	0	0	16	46	0	0
5	13	0	0	17	49	0	0
6	16	0	0	18	52	0	0
7	19	0	0	19	55	0	0
8	22	0	0	20	58	0	0
9	25	0	0	21	61	0	0
10	28	0	0	22	64	0	0
11	31	0	0	23	67	0	0
12	34	0	0	24	70	0	0

Table 2: Receiver coordinates.