Calculation of RIK synthetics in a 1D velocity model

## General input files

List of the general input files:

|  |  |  |
| --- | --- | --- |
| Name | Needed by | Purpose |
| *input.dat* | DWN  Modeling code  Graphical codes | Information about the source (moment, mechanism, fault dimensions), discretization in time and space, filtering frequencies, time windows, etc. |
| *crustal.dat* | DWN  Inversion codes | Information about the crustal model (1D homogeneous layers). |
| *stations.dat* | DWN  Inversion codes | List of station coordinates. Can be created by conversion from lat, lon using stations.f90. |

In the following the individual input files are described in detail:

input.dat

This input file is almost self-explanatory:

No. of computed frequencies (should be larger than half of the temporal discretization)

130

Length of seismograms

102.4

Artificial time shift (sec), number of segments

20. 1

Number of receivers

56

Spatial discretization along strike and dip for GF calculation

35 20

Scalar seismic moment (Nm)

1.06d19

Strike Dip Rake (degrees)

90. 80. 180.

Depth of fault reference point (m)

10.

Length and width of the fault (m)

35000. 20000.

Position of reference point on the fault (m)

17500. 20000.

No. of output time steps, no. of RIK time steps

4096 480

Rupture velocity (m/s)

3000

Number of filter ranges, followed by corner frequencies

1

0.05 .5

crustal.dat

Another self-explanatory input file:

Crustal model (free format)

number of layers

2

Parameters of the layers

depth of layer top(km) Vp(km/s) Vs(km/s) Rho(g/cm\*\*3) Qp Qs

0.00 4.00 2.000 2.600 9000. 9000.

1.00 6.00 3.464 2.700 9000. 9000.

The first layer has to be always 0.00 (free surface). A homogeneous half-space is below the last interface.

stations.dat

An example of this input file:

13.9579 8.4784 0. STA1

9.1667 7.6681 0. STA2

The columns are:

#1: X distance from the reference point to the north (in km)

#2: Y distance from the reference point to the east (in km)

#3: Depth of the station (in km)

#4: Optional station name

## Main output files

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Created by | Input for | Purpose |
| *NEZsor.dat* | DWN | Inversion codes | Contains all Green’s functions. |
| *svseis[NEZ]rik.dat* | Resulting synthetics | Graphic codes | Three files consisting of velocity seismograms of the individual N, E, Z components. The first column gives time and the other columns contain amplitudes for the individual stations. |