NAME

grnlib2sac – Generates synthetic seismograms from Green's funciton library

SYNOPSIS

grnlib2sac glib=(string) z=(float) [no]dumpgn [no]verbose date=(string) [no]dounits_cm2m [no]dointerp [no]noise nMw=(float) tr=(float) tt=(float) type=(integer) az=(float) wave_type_fiber=(string) azi_fiber=(float)

type=0 Normalized Moment Tensor Elements and Total Seismic Moment in dyne*cm.

TP Mxx={float} Myy={float} Mzz={float} Mxy={float} Mxz={float} Myz={float} Mo={float}

type=1 Double-couple Fault Strike, dip, and rake in degrees Aki's convention and Mw

str={float} dip={float} rake={float} Mw={float}

type=2 Double-couple Fault Strike, dip, and rake in degrees Aki's convention and Mw, isotropic, clvd, dc percentages

str={float} dip={float} rake={float} Mw={float} piso={float} pclvd={float} pdc={float} Piso+Pclvd+Pdc must add up to 1.0

DESCRIPTION

Computes the ground displacements (z,r,t) given one type of source input, type=0 is the tensor input, type=1 is the focal mechanism and seismic moment, or type=2 which seperates the moment into isotropic and double couple. The synthetic seismograms can be convolved with a source time function (ramp rise time and boxcar time lengths). The program reads the Green's function library (as a function of depth) for a single source station pair. The output are SAC formatted binary files. Use sac2xy.c to get the raw ASCII data. The program is ideal for when quick forward calculations are needed to check recorded data. Version 2 include a feature that adds noise relative to a moment magnitude.

REQUIRED PARAMETERS

glib={string}

The file name of the Green's function library ".glib" file. (required)

z={float}

The source depth in km. Must be a depth computed in the Green's function library ".glib" file. See par file from mkgrnlib

OPTIONAL PARAMETERS

[no]dumpgrn

write out only Green's functions for z= depth in km

[no]verbose

verbosy output for diagnosis (default off)

date=(string)

origin-time format: YYYY/MM/DD,HH24:mm:ss.ss YYYY-MM-DDTHH24:mm:ss.ssss [default "2008-01-01T00:00:00.00"]

[no]dounits_cm2m

convert output units of synthetic waveform amplitudes from centimeters to meters (default off) units originally cm displacement

[no]dointerp
perform Wiggins interpolation to sampling rate of 0.02 sec/sample (default off)

tr={float}
The ramp rise time in seconds. If tr=0 and tt>0 then the source time function is a boxcar. (default 0) no source-time func

tt={float}
The boxcar rise time in seconds. If tt=0 and tr>0 then the source time function is a triangle. (default 0) no source-time func

[no]noise
add white Gaussian noise (default off)

nMw={float}
If noise then enter the level of the noise in units of Mw for freq band of interest (required)

seed={integer}
If noise then enter the random seed for noise (default 1)

type={integer}
Source Input Mode Type where type=0 Input Moment Tensor, type=1 Input Pure Deviatoric Source (Strike/Dip/Rake) and type=2 Input Pure Deviatoric source plus isotropic component

If type=0 Mxx={float} Myy={float} Mzz={float} Mxy={float} Mxz={float} Myz={float}
Normalized Moment Tensor Elements

If type=0 Mo={float}
Total Seismic Moment in Dyne Cm.

If type=1 str={float} dip={float} rake={float}
Fault Strike, dip, and rake in degrees. Aki's convention.

If type=1 Mw={float}
Scalar seismic moment magnitude.

If type=2 str={float} dip={float} rake={float}
Fault Strike, dip, and rake in degrees. Aki's convention.

If type=2 Mw= Piso=
Total Moment Magnitude and The percent of the total moment allocated to isotropic

Example

Compute synthetics for station CMB at 10 km depth with the following strike-slip focal mechanism.

grnlib2sac glib=CMB.BK.wus.glib z=10 nonoise type=1 str=359 dip=89 rak=-179 Mw=5.1 tr=0 tt=0

SEE ALSO

mkgrnlib(1), *grnlib2sac*(1), *sacdata2inv*(1), *mtinv*(1) *rdseed*(1)