Readme: kernel calculation

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1 About the Project

These codes are used to calculate 2D kernel, dln(A) and dln(theta)(Ying Zhou et al., 2004). For ease of calculation , we first calculate kernel on the equator. Second, we rotate the coordinates of kernel to the true geographic coordinates of the seismic events and receivers. Third, kernel and phase velocity perturbation are multiplied and integrated over the 2-D area.

2 code

1. sentitivity.f90: to calculate kernel integrated over the unit area.
2. plus.f90: to rotate and multipy kernel with phase perturbation.
3. example1: check for far earthquake kernel.
   (a) example.sac : a far eqrthquake sac file used to extract spetral file.
   (b) in_spetral.txt : spetral file extracted from example.sac, wchich is inputed to calculate kernel.
   (c) sensitivity.f90: copy from '../sensitifity.f90'. Note that the grid range defined in lines 43 to 53 of the file are changed.
   (d) draw2D: to draw picture of kernel outputed.
   (e) Plaese_compare_your_output_with_this: results used to check.
4. example2: calculate dln(A) and dln(theta) for the example record named *example.sac* .
   (a) example.sac: a near earthquake sac file used to extract spetral file.
   (b) in_spetral.txt : spetral file extracted from example.sac, wchich is inputed to calculate kernel.
   (c) sensitivity.f90: copy from '../sensitifity.f90'.
   (d) plus.f90: copy from '../plus.f90'. It's uesed to multiply kernel with phase velocity perturbation and Integrate over area.
   (e) draw2D: to draw picture of kernel outputed.
   (f) Plaese_compare_your_output_with_this: results used to check.

3 Getting Started

3.1 Environment Needed

1. gfortran
2. shell
3. python or python3 with matplotlib and numpy.

3.2 Run Eamples

```
$ cd example1; sh runme.sh
$ cd example2; sh runme.sh
```