

SeisFinder Command Line Tools



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Running hazard search for entire Cybershake on Mahuika

You may wish to install python packages geopy, psycpg2, numpy, pyarrow, etc. Use **pip install --user** to install missing packages.

```
pip install geopy psycpg2 shapely --user
```

Consider upgrading pip by

```
pip upgrading pip --user
```

then update PATH to use the pip in \$HOME/.local/bin/pip

Setup

Your Cybershake root directory must contain Runs and Data.

- **Runs:** Make sure all the IM Agg have been computed and stored under each fault's Runs directory. ie. /nesi/nobackup/nesi00213/RunFolder/Cybershake/v18p6/Runs/XXXX/IM_agg
- **Data:** Containing VMs and Sources

Go to the Cybershake root directory (eg. /nesi/nobackup/nesi00213/RunFolder/Cybershake/v18p6) and execute the setup.py

```
baes@mahuika02: /nesi/nobackup/nesi00213/RunFolder/Cybershake/v18p6$ python /nesi/project/nesi00213/deploy/seisfinder2/tool/setup.py --help
```

```
usage: setup.py [-h] [-n NAME] cybershake_dir empirical_dir ll_file
positional arguments:
  cybershake_dir      Cybershake Root directory eg.
                      /nesi/nobackup/nesi00213/RunFolder/Cybershake/v18p6
  empirical_dir       Empirical data root directory eg.
                      /nesi/nobackup/nesi00213/empiricals/v18p5
  ll_file             Path to the .ll file
optional arguments:
  -h, --help          show this help message and exit
  -n NAME, --name NAME Optional name for Cybershake.
```

module add Python/2.7.14-gimkl-2017a

The following example was taken from v18p6_3 directory.

```
baes@mahuika02: /nesi/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3$ python /nesi/project/nesi00213/deploy
/seisfinder2/tool/setup.py . /nesi/nobackup/nesi00213/empiricals/v18p6 non_uniform_whole_nz_with_real_stations-
hh400_v18p6.ll
```

```
/scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/imdb.h5
{empirical_dir: /nesi/nobackup/nesi00213/empiricals/v18p6, fault_list: /scale_wlg_nobackup/filesets/nobackup
/nesi00213/RunFolder/Cybershake/v18p6_3/fault_list.csv,
  hazard_dir: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard,
  ll: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3
/non_uniform_whole_nz_with_real_stations-hh400_v18p6_land.ll,
  name: v18p6_3, root_dir: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3,
  runs_dir: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Runs,
  srf_dir: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Data/Sources}
```

```
Config file has been successfully written: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake
/v18p6_3/config.yaml
```

```
Warning: More faults found than simulated results : Ignoring these
```

```
['Otarawest02', 'Otarawest01', 'Wairaka05', 'Otarawest03', 'FiordSZ09', 'FiordSZ03', 'TaurTrE02', 'Tuakana11',
'Ohena02', 'MaungatiE01', 'Ohena01']
```

```
Output CSV successfully written: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3
/fault_list.csv
```

```
/scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3
```

```
/non_uniform_whole_nz_with_real_stations-hh400_v18p6_land.ll
```

```
Written /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/imdb_calc.sl
```

```
sbatch imdb_calc.sl
```

```
Submitted batch job 1874061
```

This creates a config.yaml that contains all the necessary config info, creates fault lists, converts .ll into .csv etc, and builds IMDB by crafting a .sl script and automatically submitting it. (This takes about an hour)



In earlier versions, setup.py used to produce hazard_calc_X.sl scripts. We have a better solution, and no longer support this. This step will be deprecated.

```
Written /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard
/hazard_calc_SA_0p5.sl
Written /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard
/hazard_calc_PGA.sl
Written /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard
/hazard_calc_SA_0p2.tar.sl
Written /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard
/hazard_calc_SA_0p1.sl
Written /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard
/hazard_calc_SA_5p0.tar.sl
Written /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard
/hazard_calc_SA_0p2.sl
Written /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard
/hazard_calc_SA_3p0.sl
Written /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard
/hazard_calc_SA_2p0.sl
Written /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard
/hazard_calc_SA_5p0.sl
Written /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard
/hazard_calc_SA_1p0.sl
```

A sample config.yaml looks like this

```
empirical_dir: /nesi/nobackup/nesi00213/empiricals/v18p6
fault_list: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/fault_list.csv
hazard_dir: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard
ll: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3
/non_uniform_whole_nz_with_real_stations-hh400_v18p6_land.ll
name: v18p6_3
root_dir: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3
runs_dir: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Runs
srf_dir: /scale_wlg_nobackup/filesets/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Data/Sources
```

Run

Go to Cybershake root directory. (Make sure machine_env.sh has been imported and)

```
baes@mahuika02: ~$ python /nesi/project/nesi00213/deploy/seisfinder2/site/site_search.py --cs-version v18p6_3 --im SA_5p0 --location -42.7012 172.8003 --hazard
```

This calculates hazard for the given location for SA_5p0.

You can use a CSV file that contains latitude and longitude of multiple locations.

```
baes@mahuika02: ~$ python /nesi/project/nesi00213/deploy/seisfinder2/site/site_search.py --cs-version v18p6_3 --im SA_5p0 --csv-location /nesi/nobackup/nesi00213/RunFolder/Cybershake/v18p6_2/test.csv --hazard
```

Note that once you set parameters, cs-version, im and locations etc., the system remembers them. So you can simply execute the following command and get the same result

```
baes@mahuika02: ~$ python /nesi/project/nesi00213/deploy/seisfinder2/site/site_search.py --hazard
```

This can be useful if you want to compute deagg for the same location and same setting. You just need to put additional parameters such as exceedance as below.

```
baes@mahuika02: ~$ python /nesi/project/nesi00213/deploy/seisfinder2/site/site_search.py --deagg --exceedance 0.0051
```

You can make the system forget the setting by --clear switch

```
baes@mahuika02: ~$ python /nesi/project/nesi00213/deploy/seisfinder2/site/site_search.py --clear
```

If you put --script option, it won't do the calculation. Instead it will output a file hazard_calcs.sh in the current directory. This is useful if you wish to use NeSI to run hazard calculation for all locations and produce hazard map.

```
baes@mahuika02: ~$ python /nesi/project/nesi00213/deploy/seisfinder2/site/site_search.py --cs-version v18p6_3 --im SA_5p0 --csv-location /nesi/nobackup/nesi00213/RunFolder/Cybershake/v18p6_2/test.csv --hazard --script
```

Suppose there is ~/hazard_calcs.sh. You can run prepare_hpc_hazard.calcs.sh for SLURM submission.

```
baes@mahuika02: ~$ bash /nesi/project/nesi00213/deploy/seisfinder2/site/mahuika/prepare_hpc_hazard_calc.sh

Found working directory /nesi/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard/SA_5p0
Found 80 unique locations
Making a slurm script for processing locations 0 - 80
....Done!!
Go to the following directory and run submit_all.sh
/nesi/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard/SA_5p0/slurm
```

Everything you need is placed in the directory. Go to the directory and execute submit_all.sh (SLURM doesn't like to process more than 10000 lines. If there are more locations than the limit, it will create multiple .sl scripts and submit_all.sh will submit them all for you)

```
baes@mahuika02: /nesi/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard/SA_5p0/slurm$ ./submit_all.sh
Submitted batch job 69390
Submitted batch job 69391
Submitted batch job 69392
Submitted batch job 69393
...
```

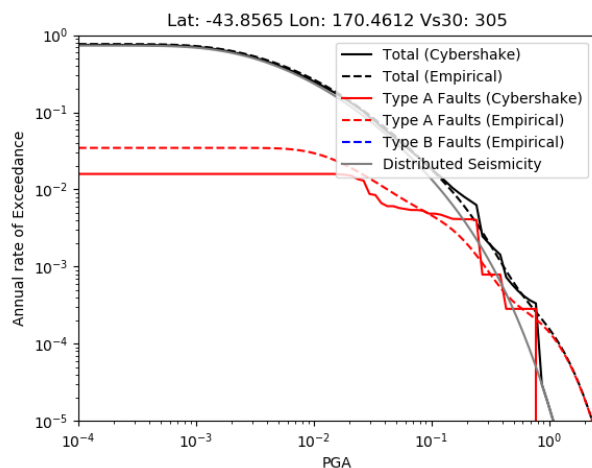
Hazard map: When everything is completed, you can submit the following .sl script that has been automatically generated for you. Just edit the exceedance value if required. For details, see <https://github.com/ucgmsim/seisfinder2/tree/master/CLI/hazard>

```
baes@mahuika02: /nesi/nobackup/nesi00213/RunFolder/Cybershake/v18p6_3/Hazard/SA_5p0/slurm$ sbatch
execute_hazard_map.sl
```

Sample Outputs

Hazard Curve

```
site_search.py --cs-version 18.6 --location -43.89 170.435 --hazard --im PGA
```



Deaggregation

```
./site_search.py --cs-version 18.6 --location -43.89 170.435 --deagg --im PGA --exceedance 0.01
```



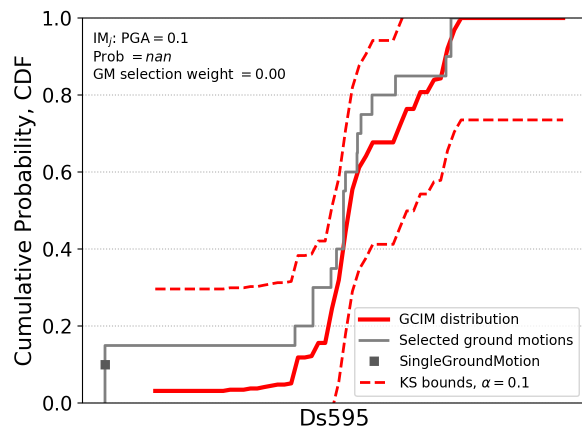
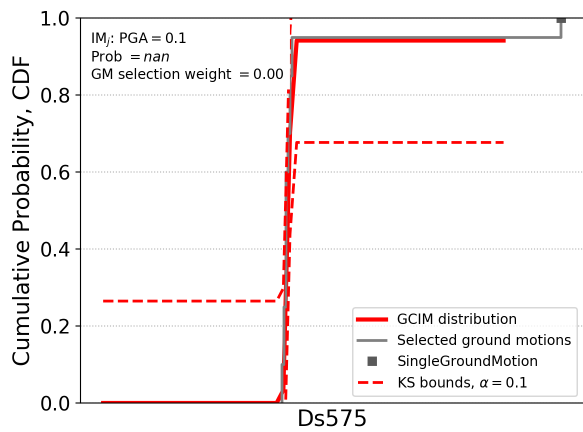
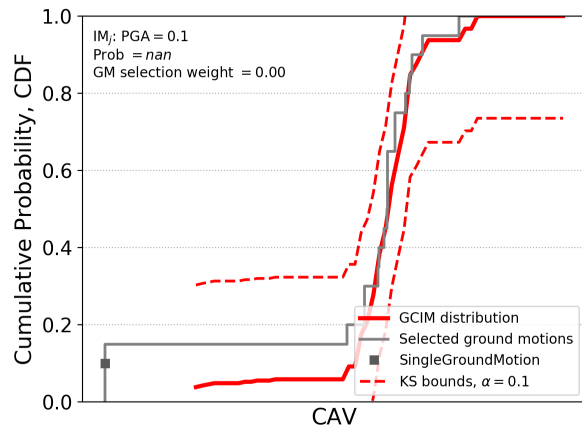
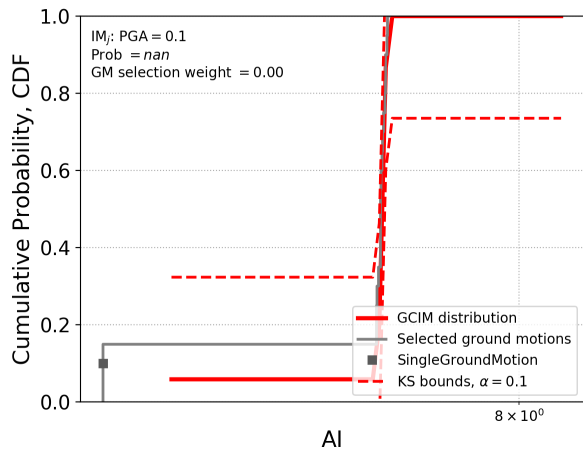
Deaggregation_C...Val0.157364.txt

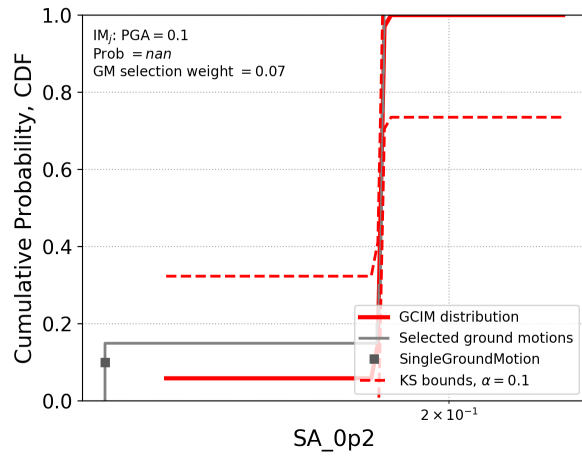
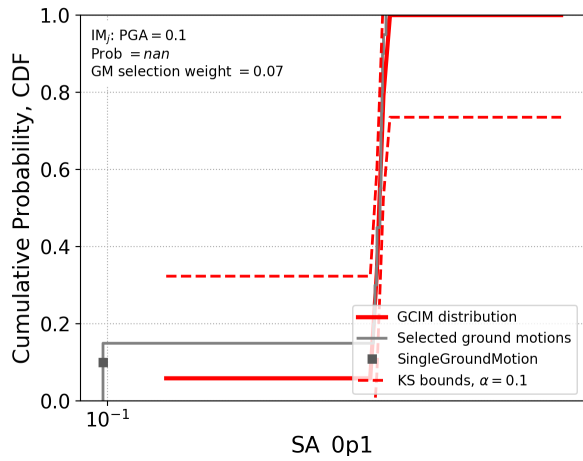
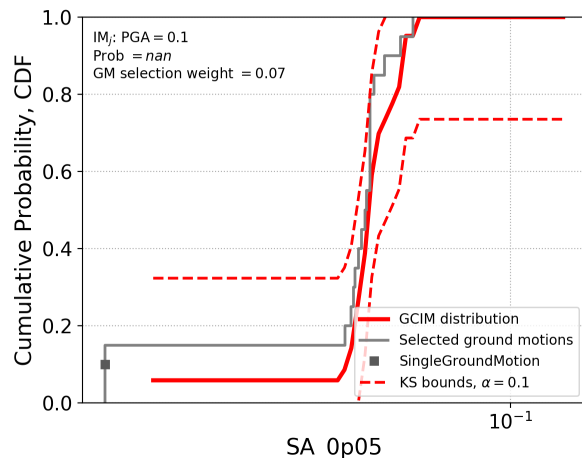
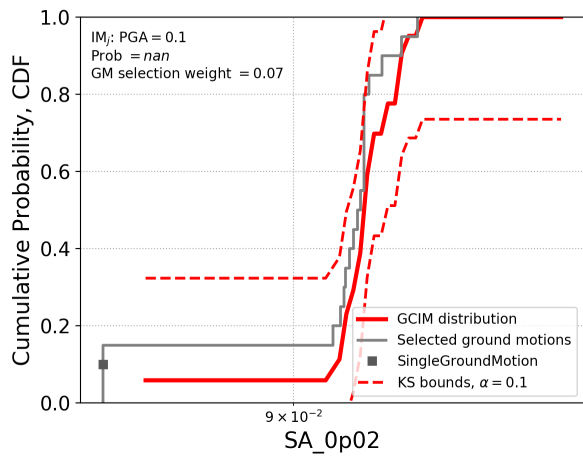
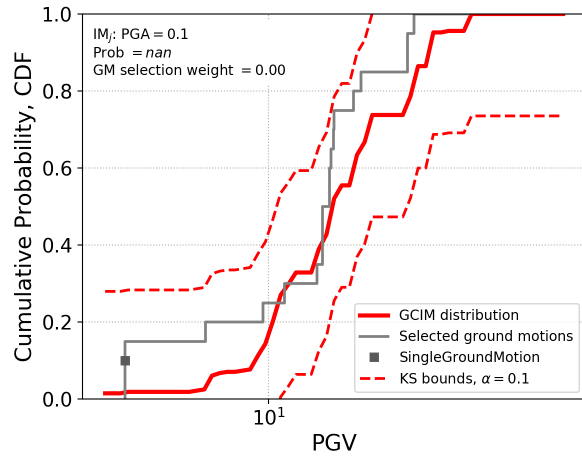
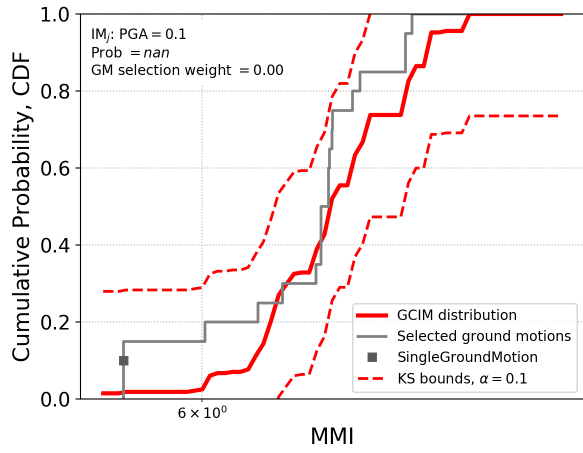


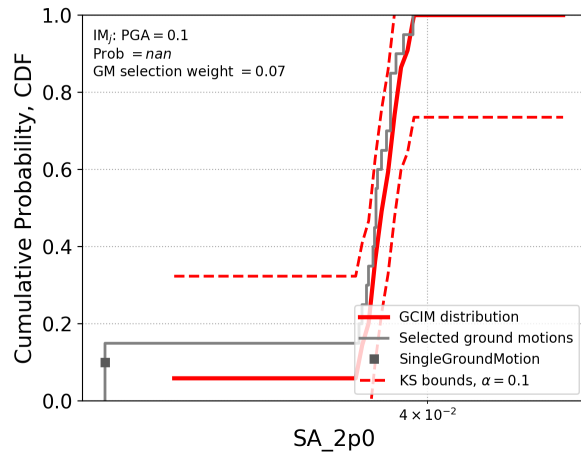
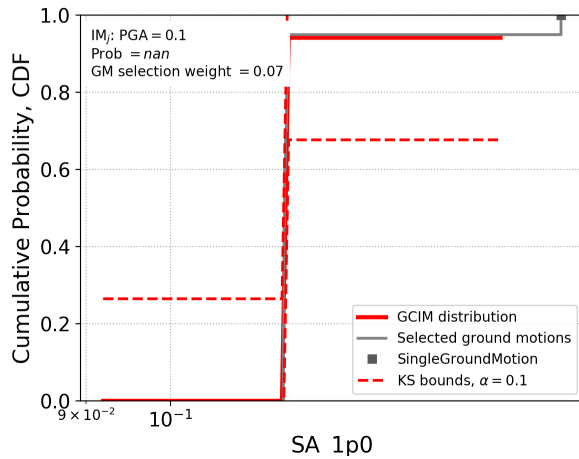
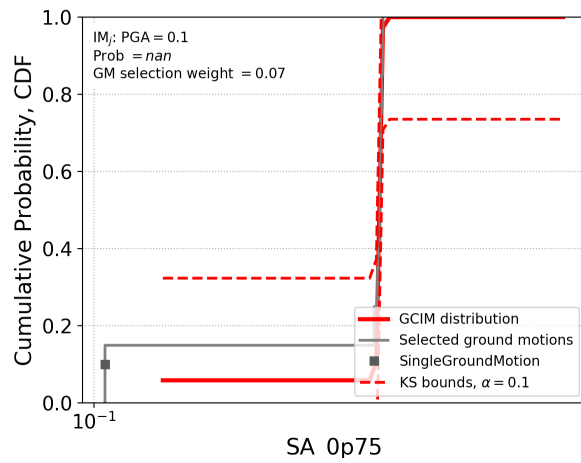
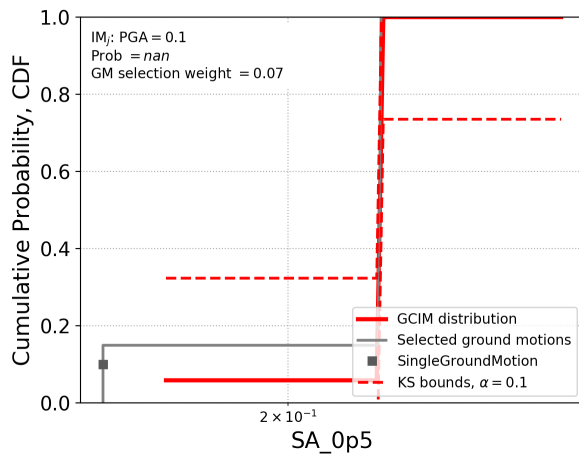
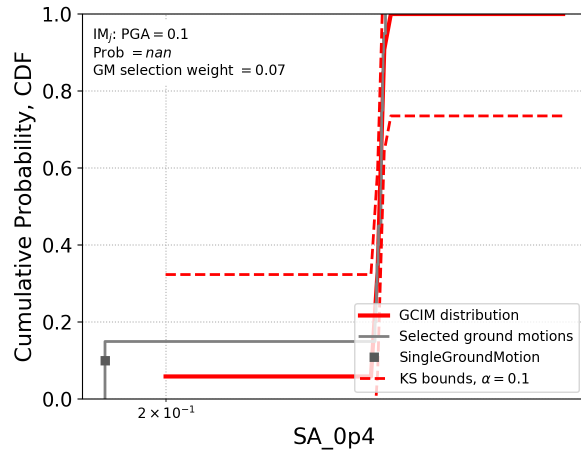
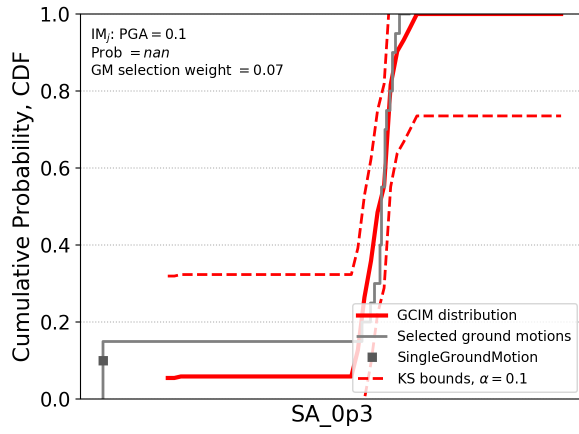
Deaggregation_E...Val0.157364.txt

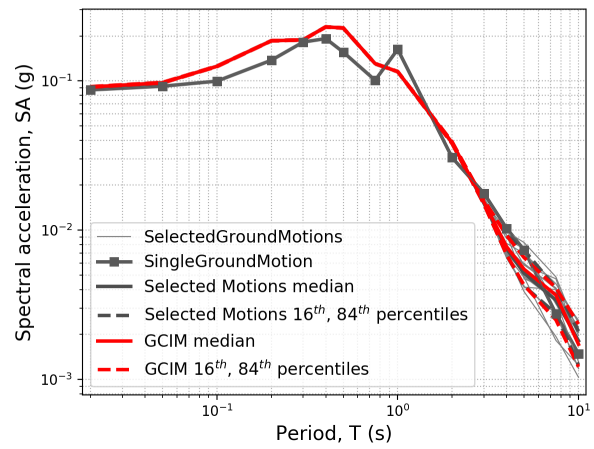
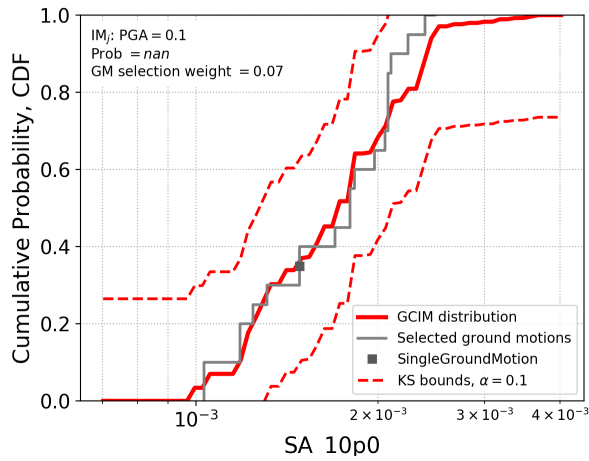
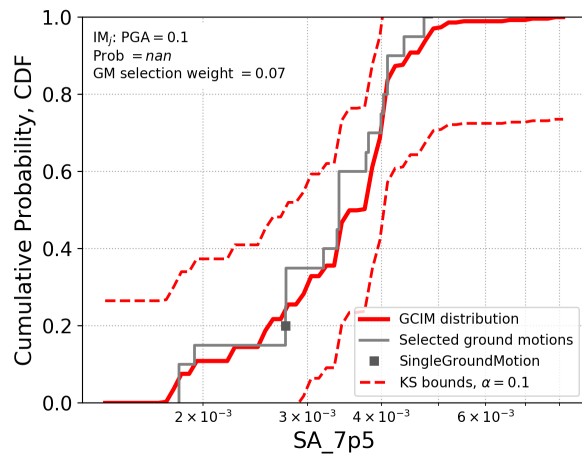
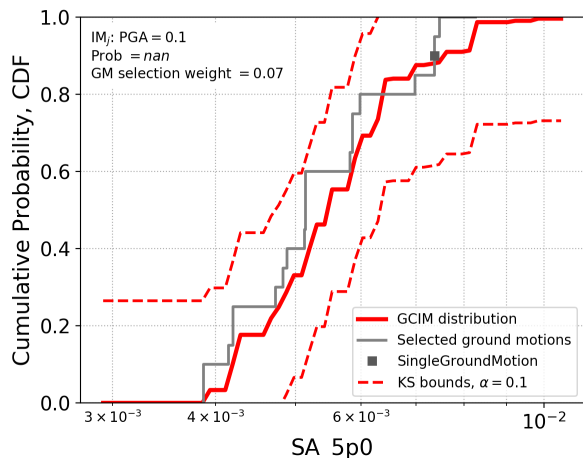
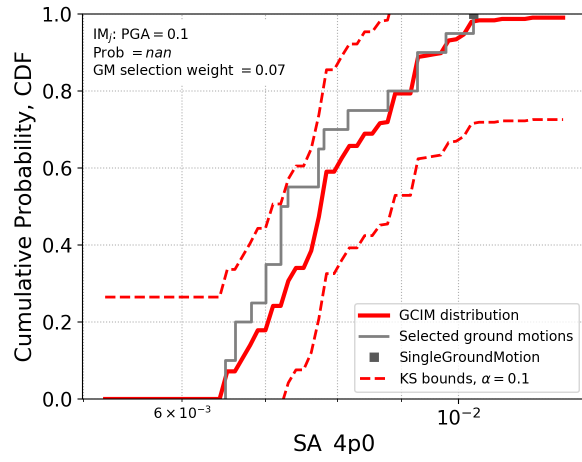
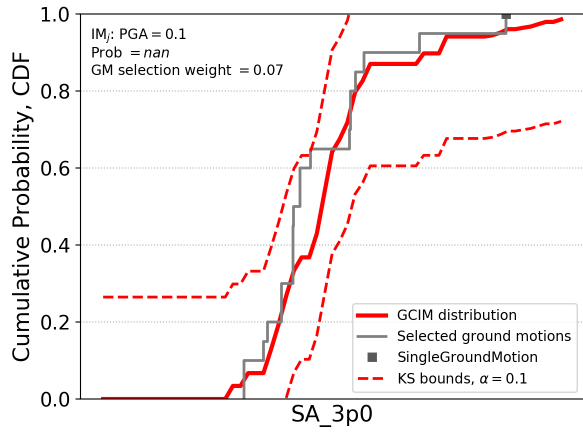
GM Selection

```
site_search.py --cs-version 18.6 --location -43.89 170.435 --gmselect --im PGA --imvalue 0.1
```











automated_selection.txt