Non-Ergodic codes

This wiki explains some of the effort we have put towards multiple event validation.

Creation of input

The code for the creation of the input files is on https://github.com/ucgmsim/validation_multiple_events

Prerequisites

- Running the Intensity Measure calculations code for simulations and observations for the events that go into the validation
    - This means having at least: aggregate IM file, metadata and Rrup CSV files
- Somehow getting the IM for the empirical distributions for the events (this is not implemented yet).
- A comprehensive list of all stations and vs30 per station used in the simulations and present in the observations

File structure required for the code

The following type of file structure is needed to run the code:

```
root_dir_validation/
  event1
      emp
          im_values.csv
          metadata.csv
          rrup.csv
      obs
          im_values.csv
          metadata.csv
          rrup.csv
      sim
           2012p075555.info # Metadata from the SRF creation
           im_values.csv # From IM_calculation
           metadata.csv # From IM_calculation
           rrup.csv # From IM_calculation
  event2
      emp
|   |   .....
      obs
        .....
      sim
    |   .....
....
  eventN
      emp
|   |   .....
      obs
        .....
      sim
    |   .....
  station_file.ll
  station_file.vs30
```

TODO: create a script to create the hierarchy and copy data as needed from Kupe.

Output

The output consists of 6 files:

- A station file. Each line has an ID, a station name, the longitude and latitude of the station, Vs30 and Kappa.
- A ground motion file. Each line has an ID, Rrup, Rjb and R_x. This will get used in the IM files
- An event file. Here we require an ID, the event name, longitude and latitude of the hypocentre ❓, Mw, CD, strike, dip, rake and stress drop.
- 3 IM files for simulations, observations and empiricals. Each of the files is alike, having per line: a ground motion ID, an event ID, a station ID and the list of IMs that have been calculated.
- Between Obs and Sim pair, we must have a common set of events and stations. But different events may have different set of stations.

R Code

Plotting