Engineering Seismology and Seismic Hazard – 2019

Exercise #2

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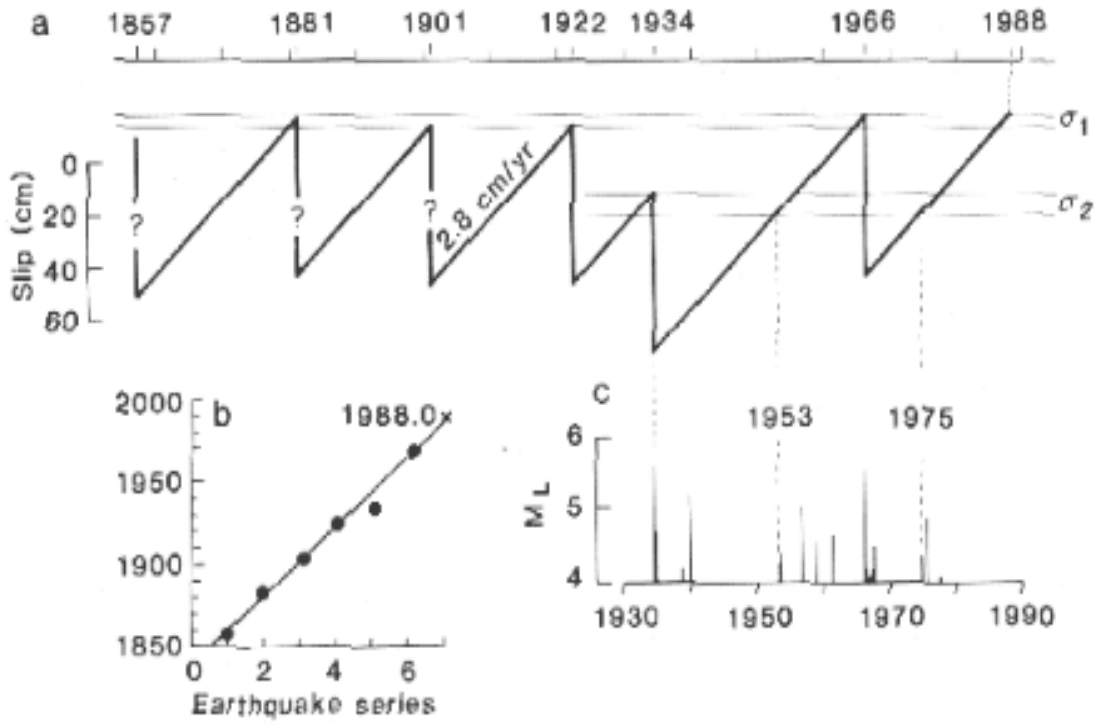
Question 1 – EQ Magnitude



Lindh & Bakun (1985)

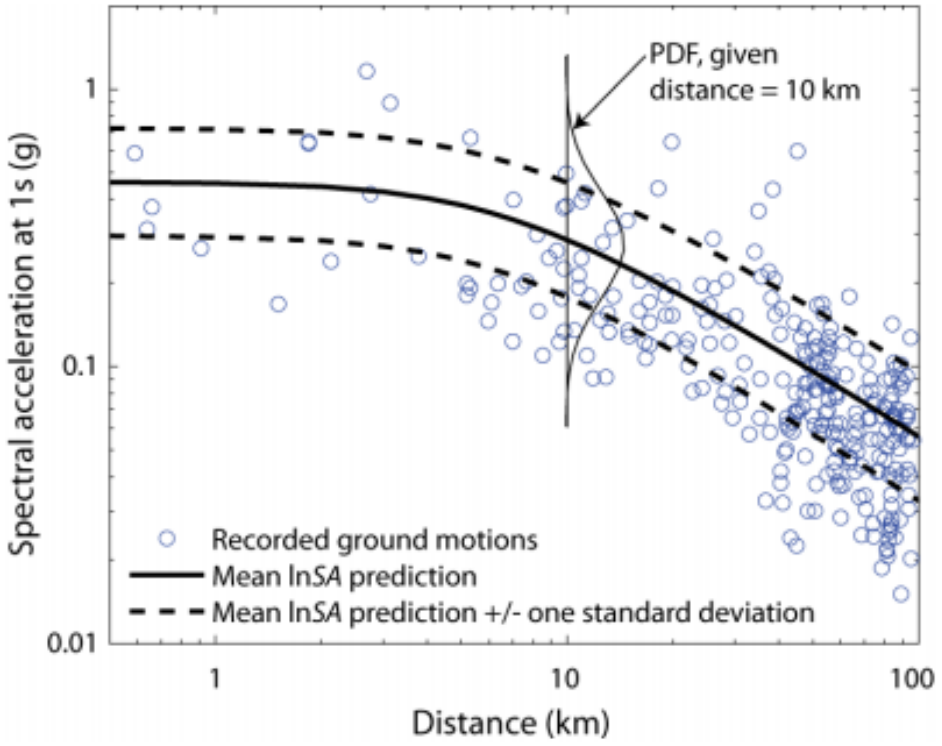
Parkfield Experiment

Time predictable earthquake model

Seismic Cycle, Seismic Moment, Scaling Laws (Wells & Coppersmith 1994)

Why earthquakes cannot be predicted?

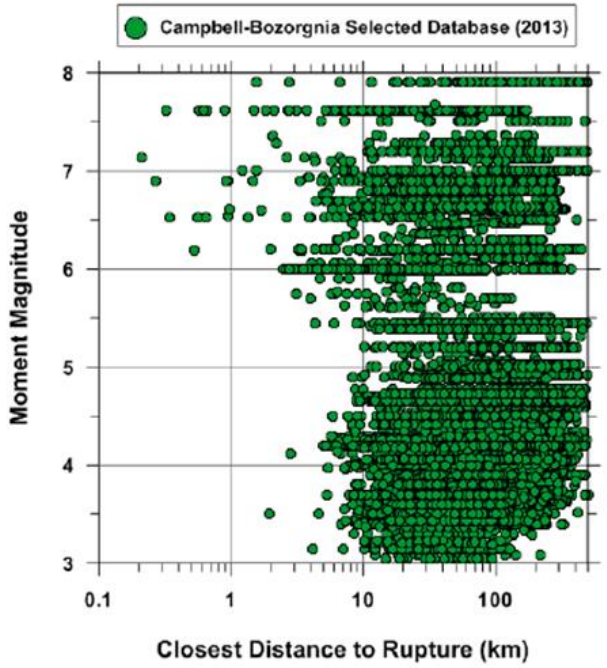
Question 2 - GMPEs



Baker (2008)

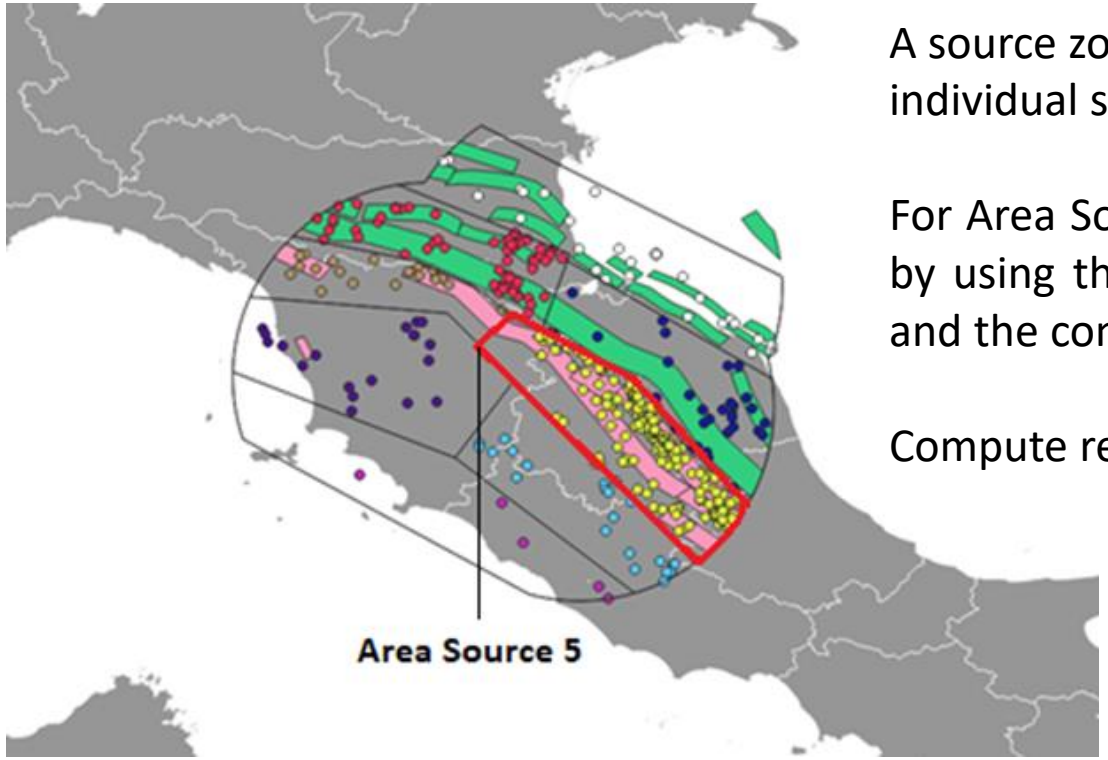
Plot GMPE by Cornell et al (1979) as mean +- std. dev

Discuss the range of GMPEs



Campbell & Bozorgnia (2013)

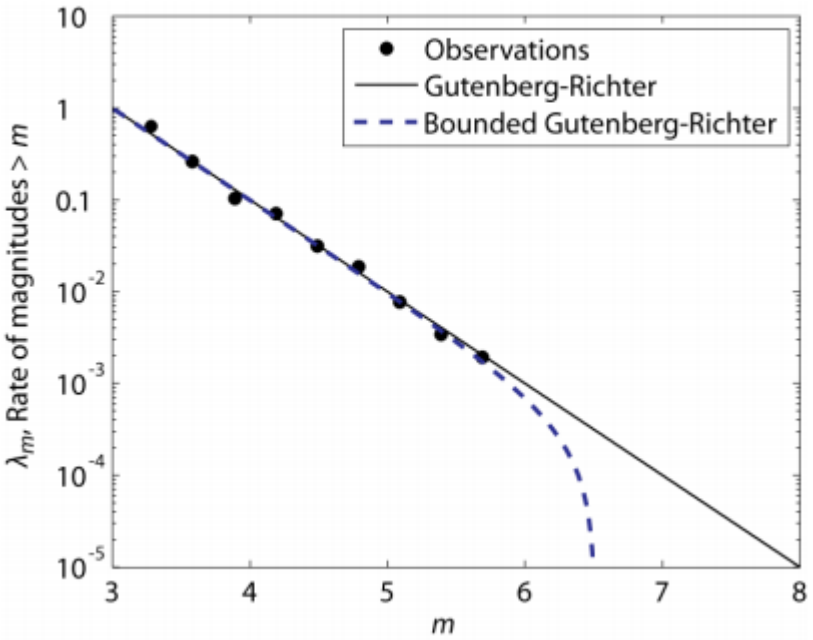
Question 3 – GR Relation



A source zonation is given from an individual study.

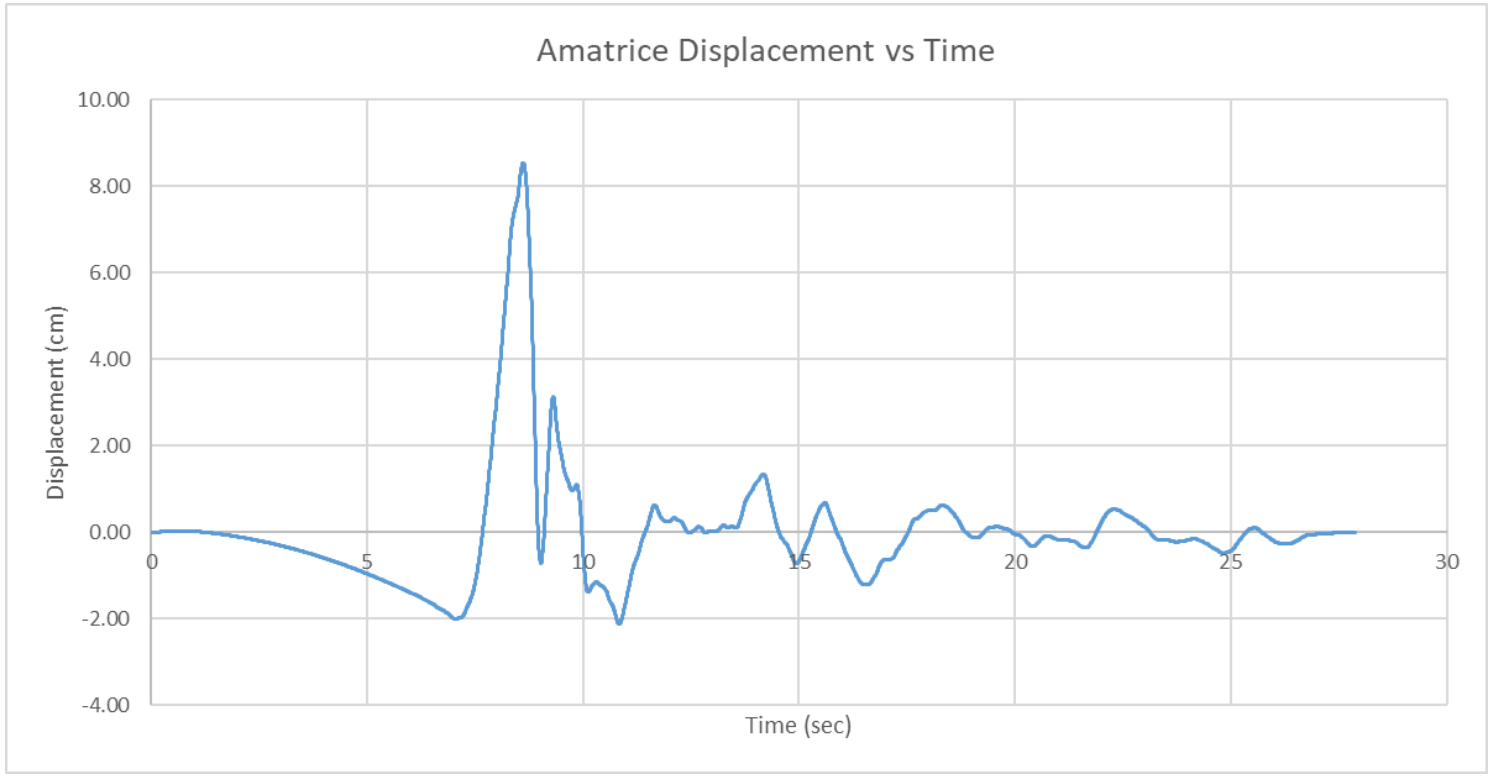
For Area Source 5, fit a GR relation by using the catalogue Perugia.csv and the completeness information.

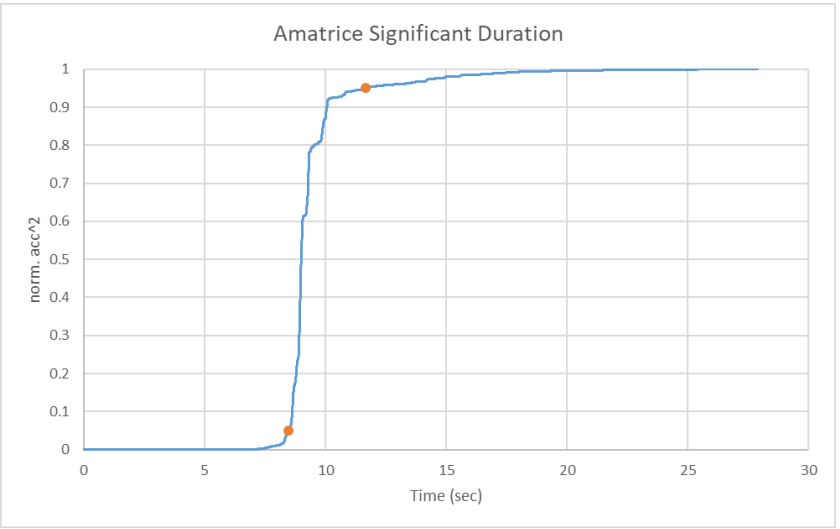
Compute return periods.



Baker (2008)

Question 4 - IMs

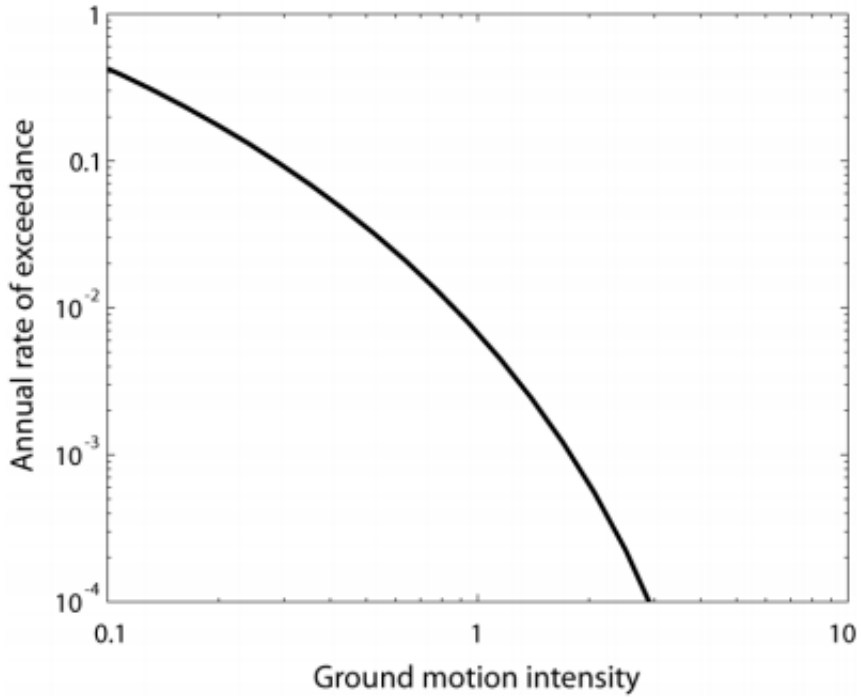




For the given Amatrice 2016 earthquake D-T plot, obtain A-T and V-T, then compute IMs:

PGA, PGV, PGD and Significant Duration

Question 5 – PSHA Results

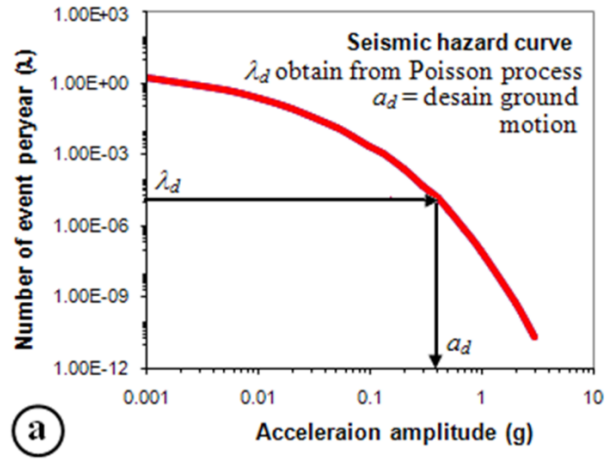


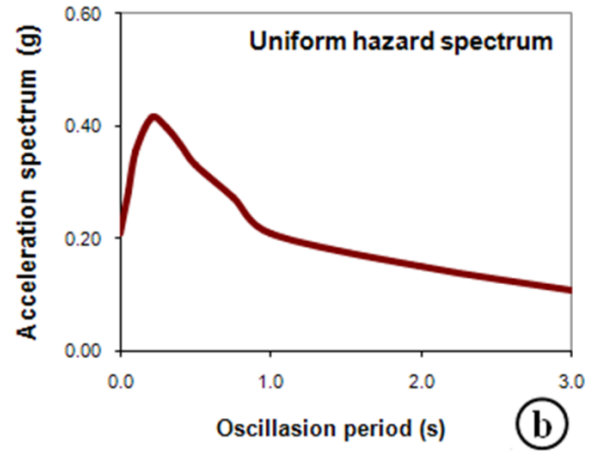
Baker (2008)

The resulting hazard curves from a PSHA study done for Algiers are given in the Algiers_HC.csv file.

Plot the given hazard curves in a plot.

By using the hazard curves, compute the UHS for 2% and 10% in 50 years.





Makrup et al. (2015)