UNIVERSITÀ
DEGLI STUDI
DI PADOVA

Dipartimento
di Fisica
e Astronomia
Galileo Galilei

Temporal and spatial analysis of earthquakes in Italy in the last century

Jamilov Javlon, Pirazzo Tommaso, Secco Benedetto

14 luglio 2025

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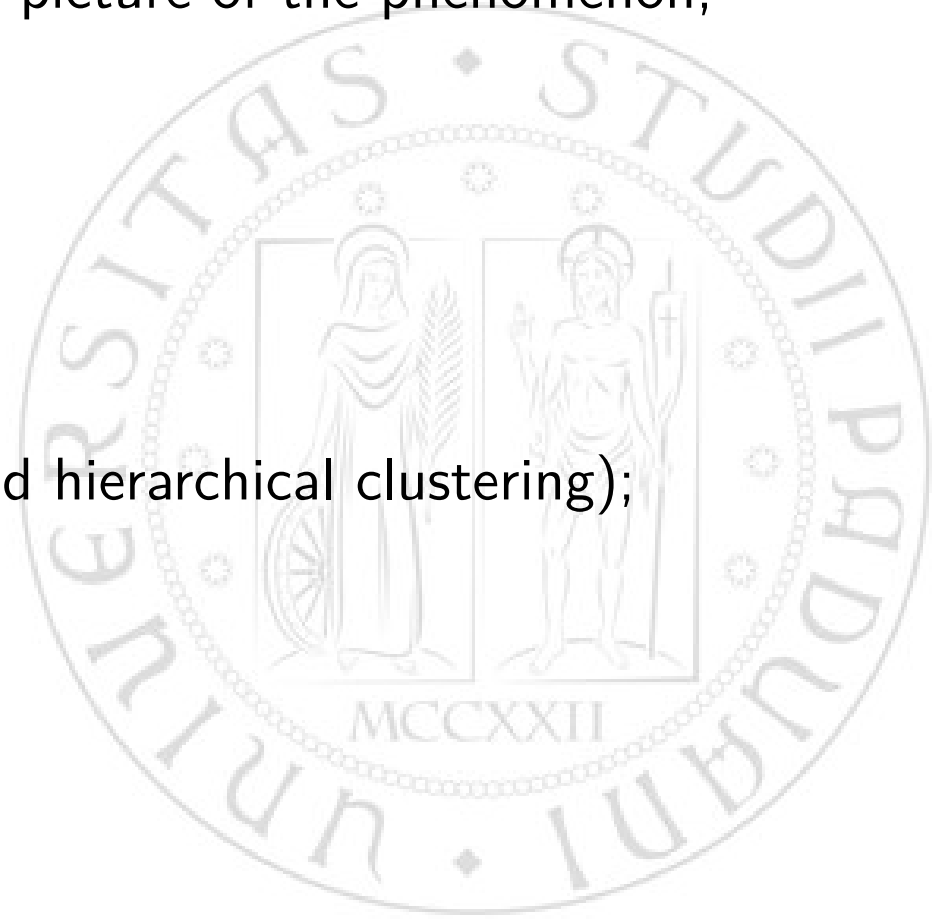

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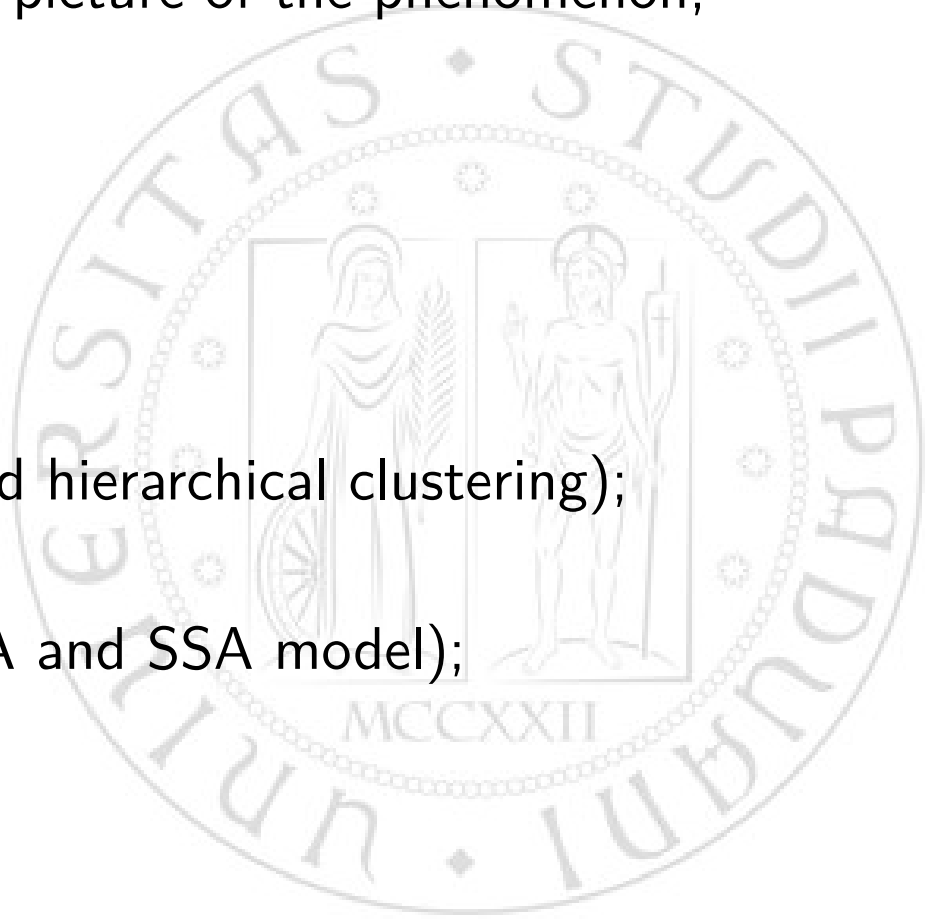

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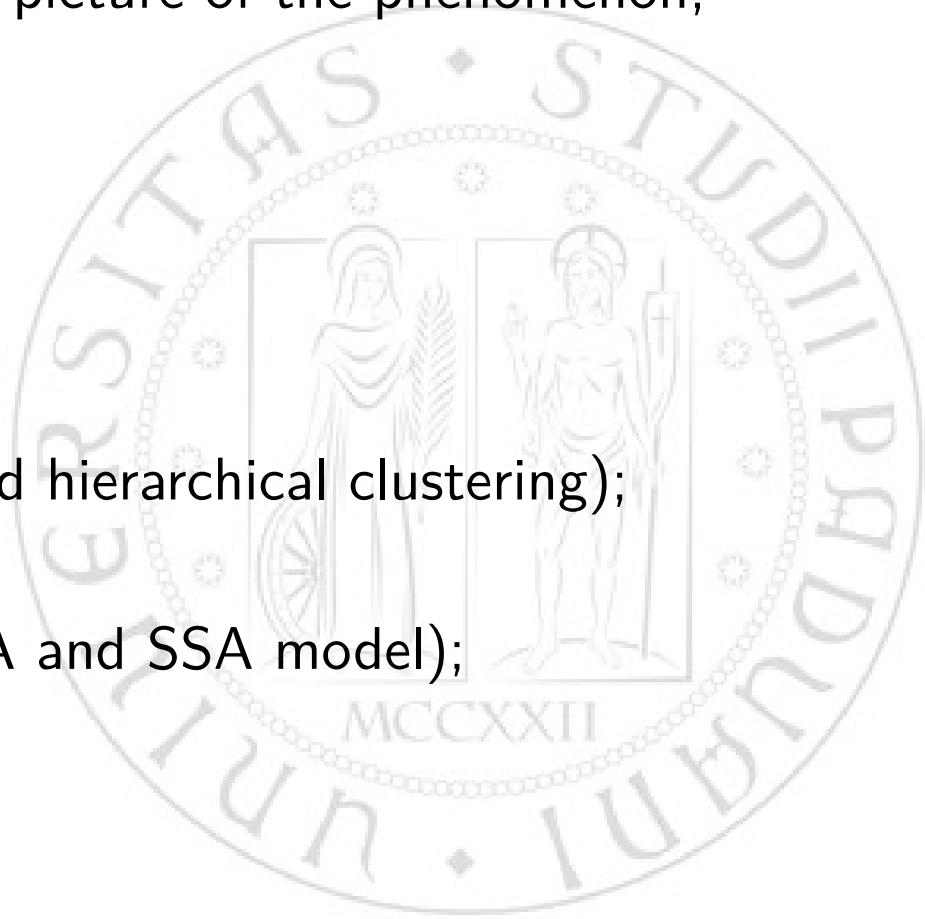

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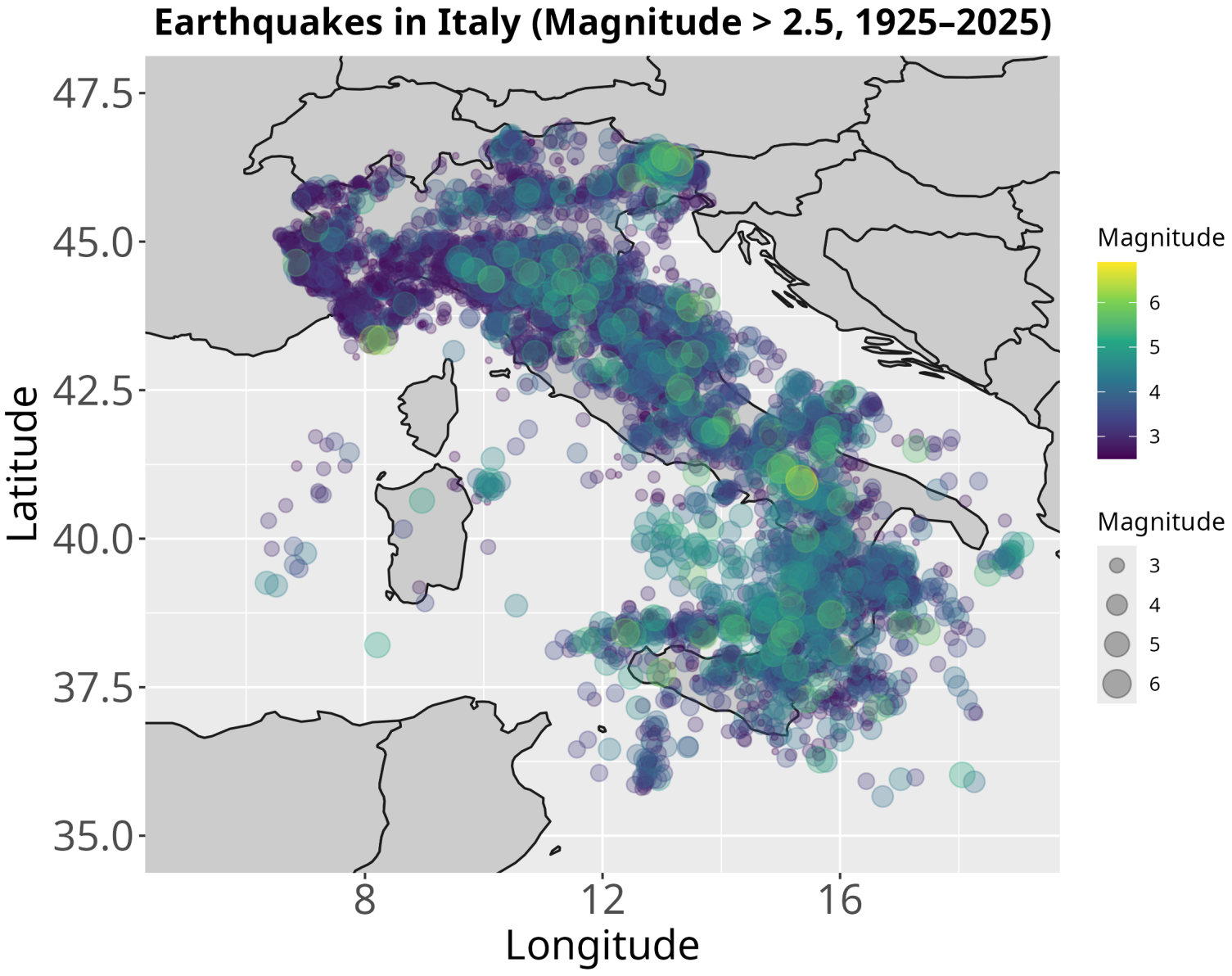

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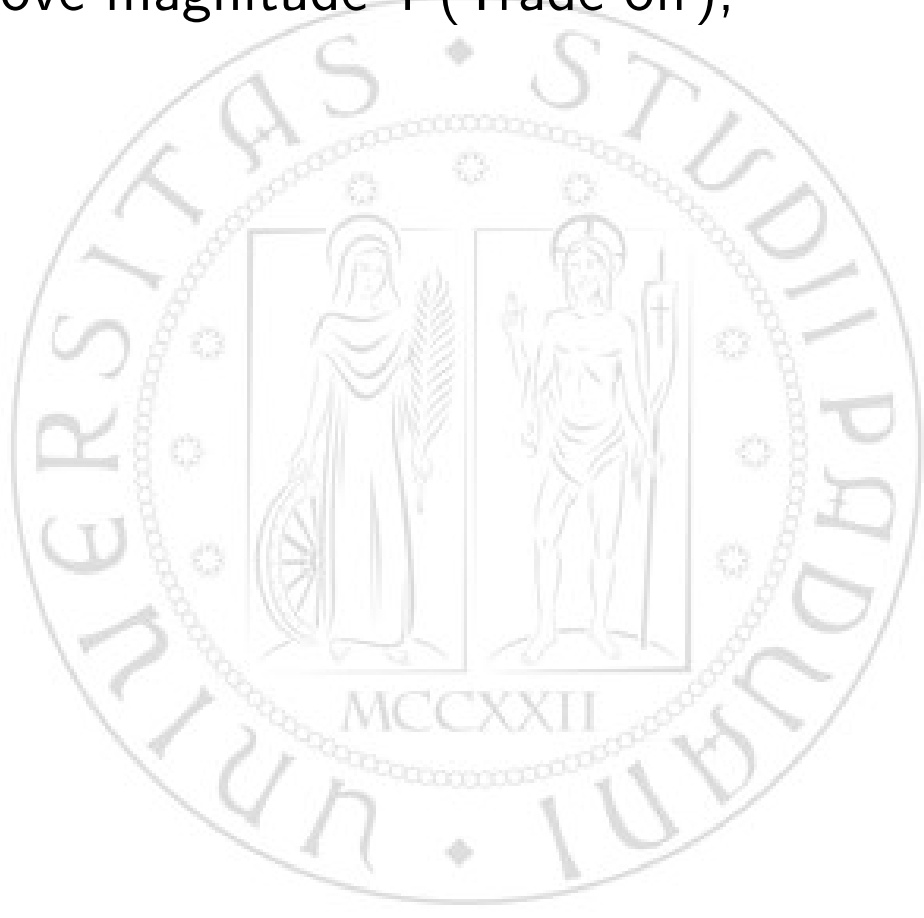

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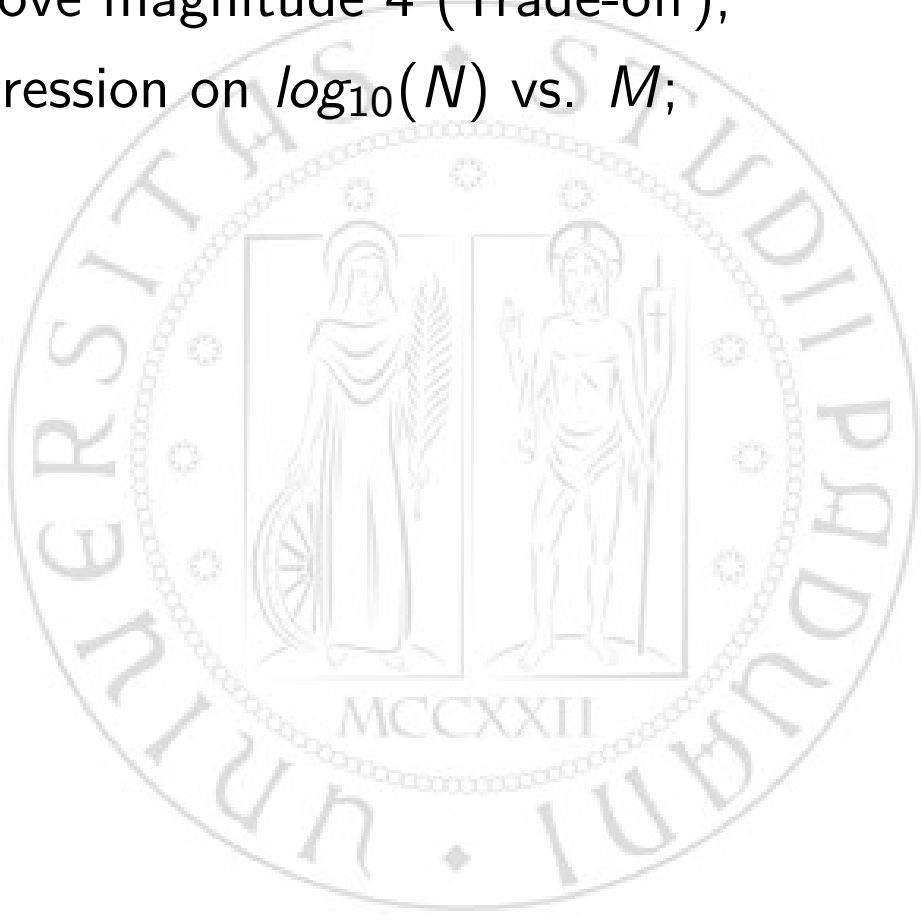

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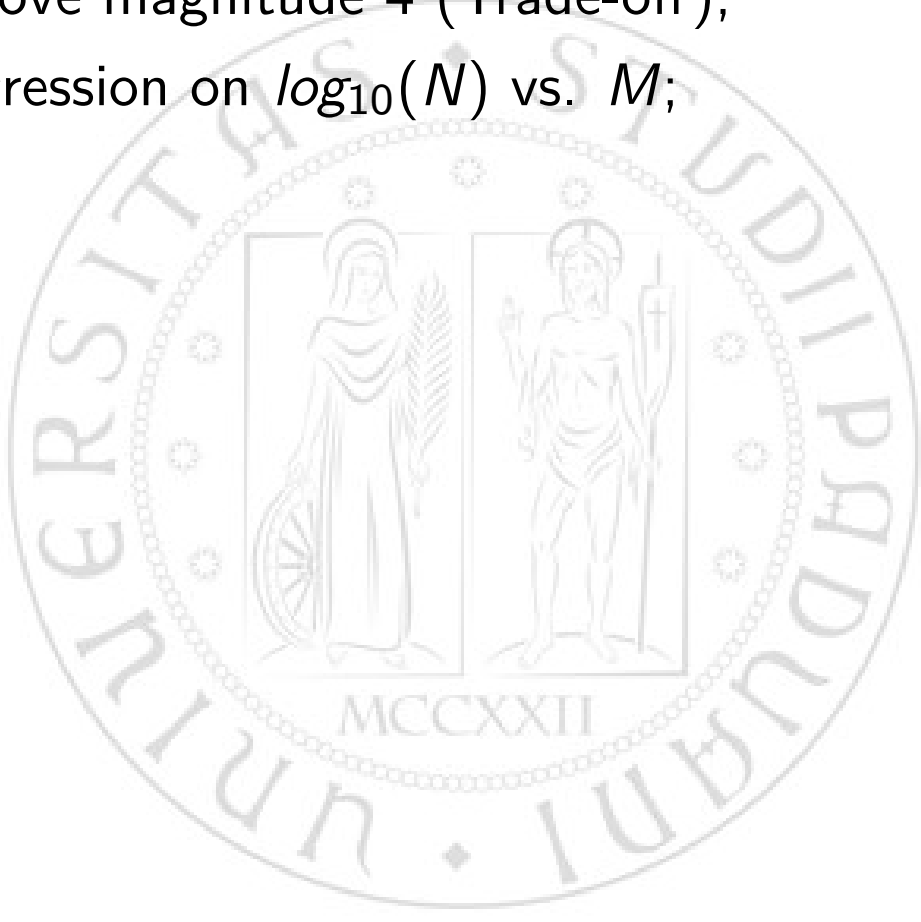

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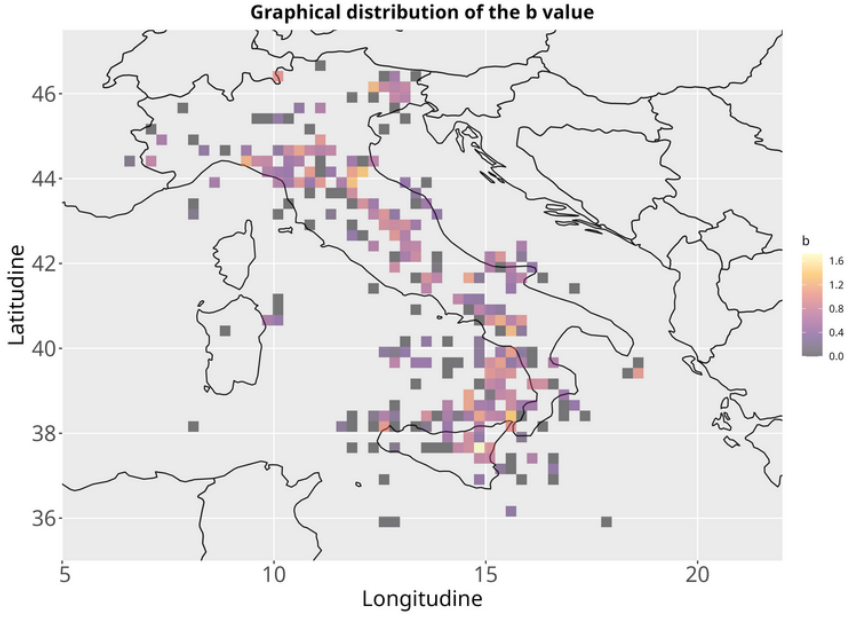

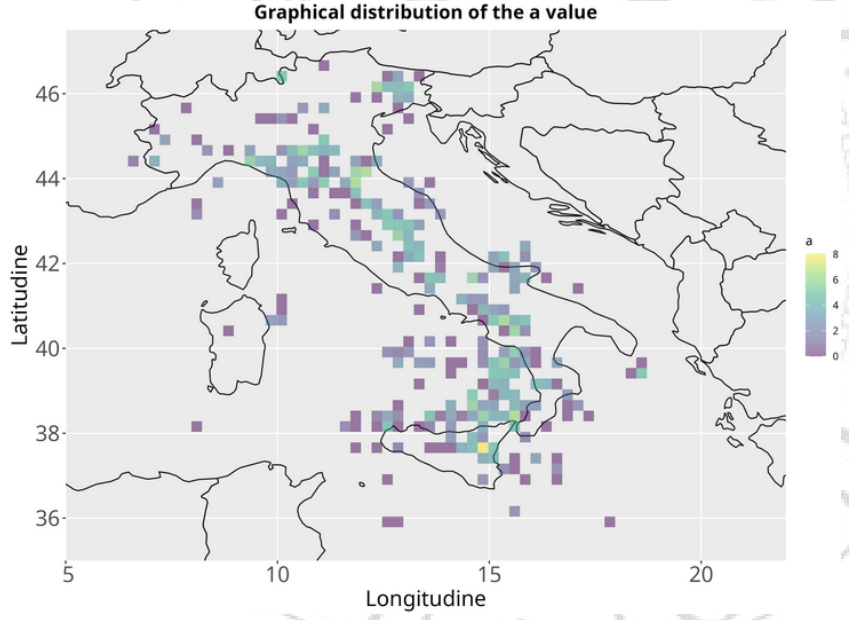

Adding tectonic plates boundaries

```
# https://www.usgs.gov/programs/earthquake-hazards/google-
    earthtmkml-files -> page where you can find the file for
     the edge of the plates

plates <- st_read("doc.kml", layer = "Plate Interface")
                  ...

# add tectonic plates boundaries
a_plot_plates <- ggplot() +

        # borders
        borders("world",
        regions = c(reg),
        fill = "gray80", colour = "gray10", alpha = 0) +

        # tectonic plates boundaries layer
        geom_sf(data = plates, color = "blue", size = 2) +
                  ...
```

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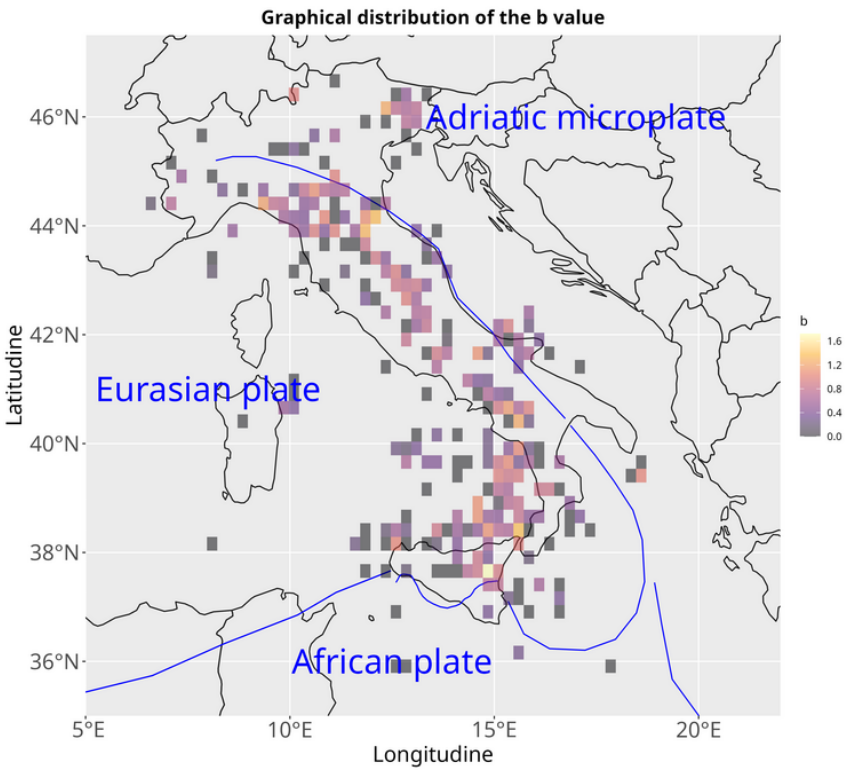
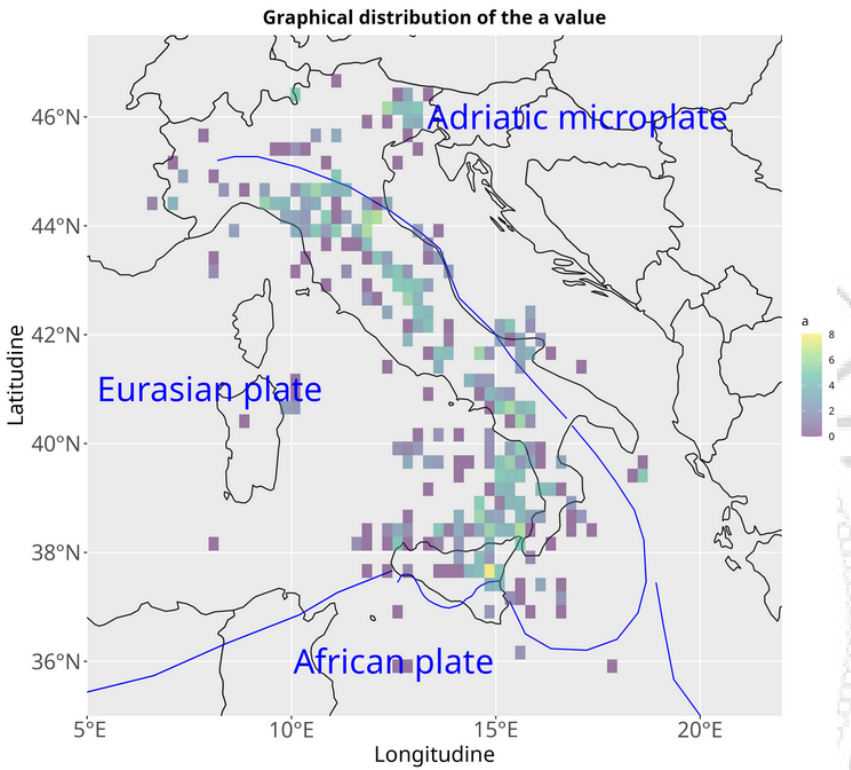
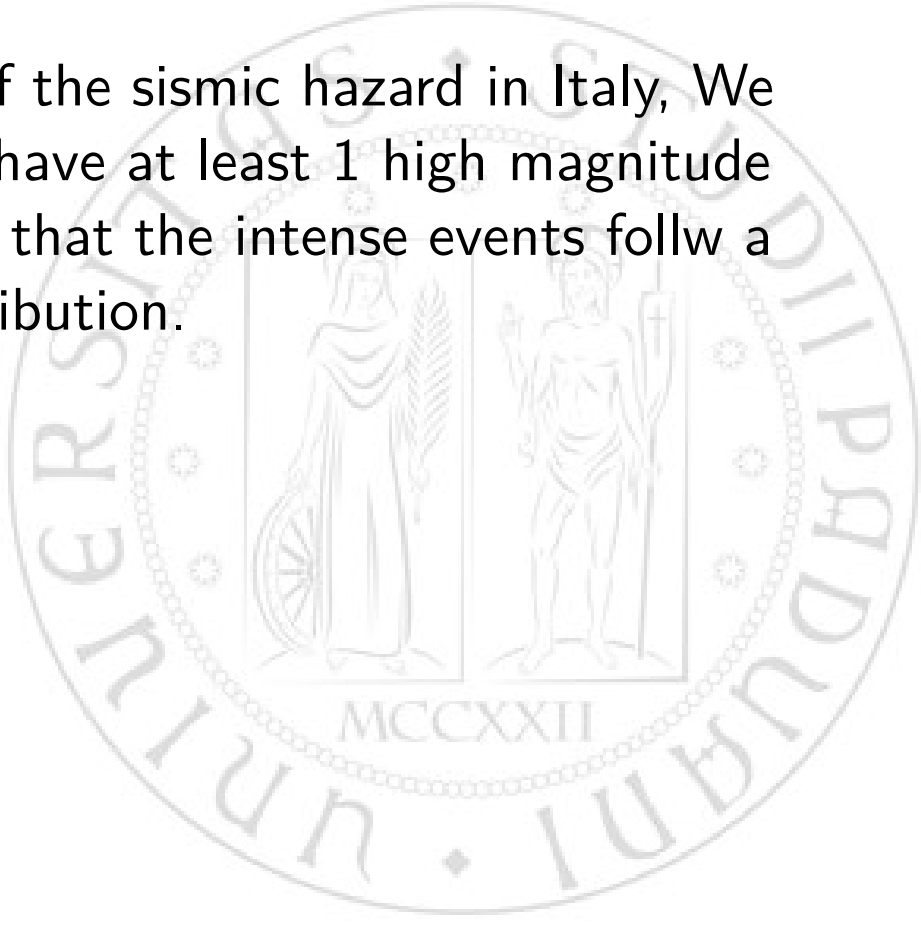




Naive model for sismic hazard

In order to provide an exstimation of the sismic hazard in Italy, We tried to calculate the probability to have at least 1 high magnitude event in the next 10 years assuming that the intense events follw a Poisson distribution.



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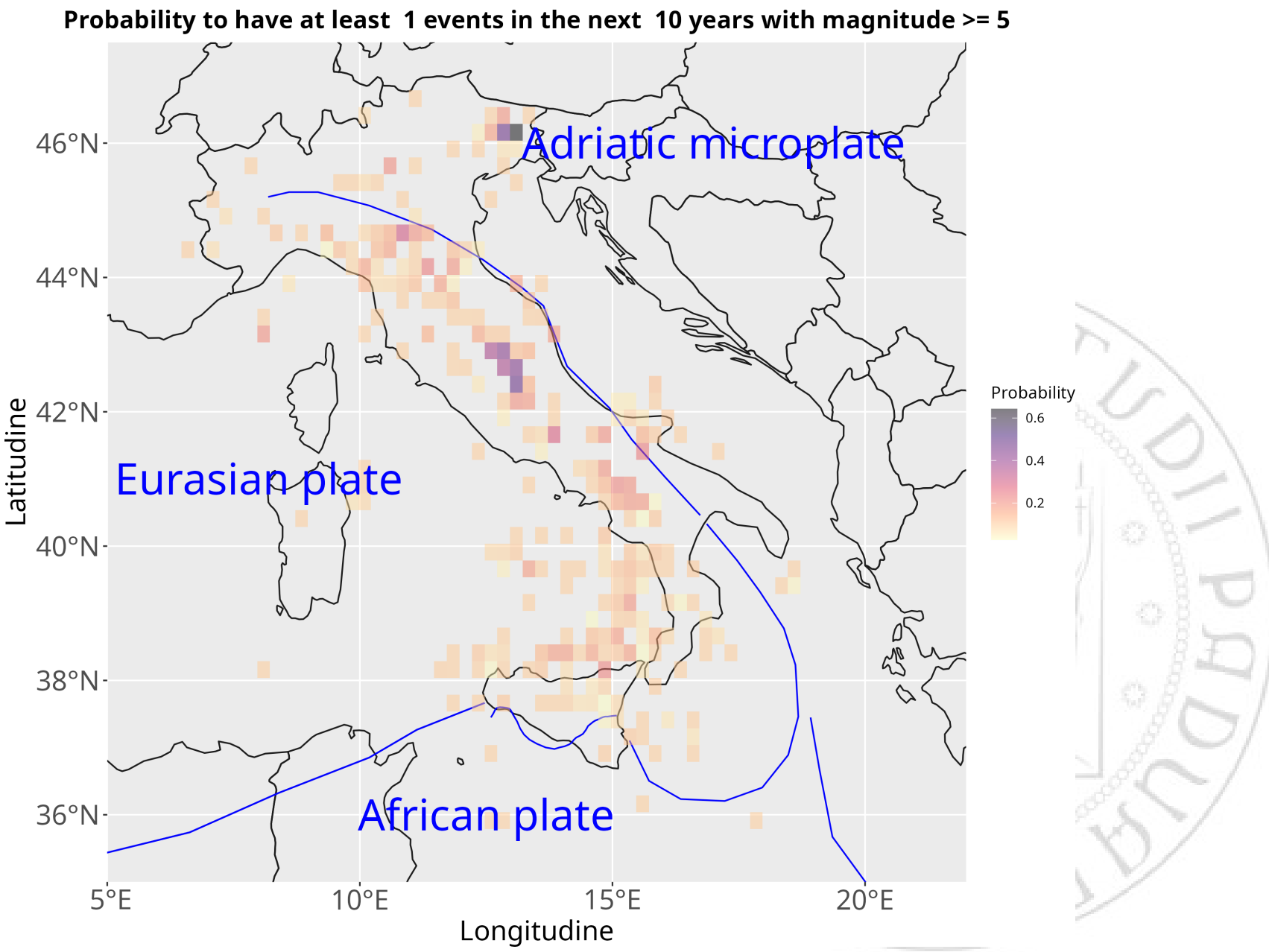
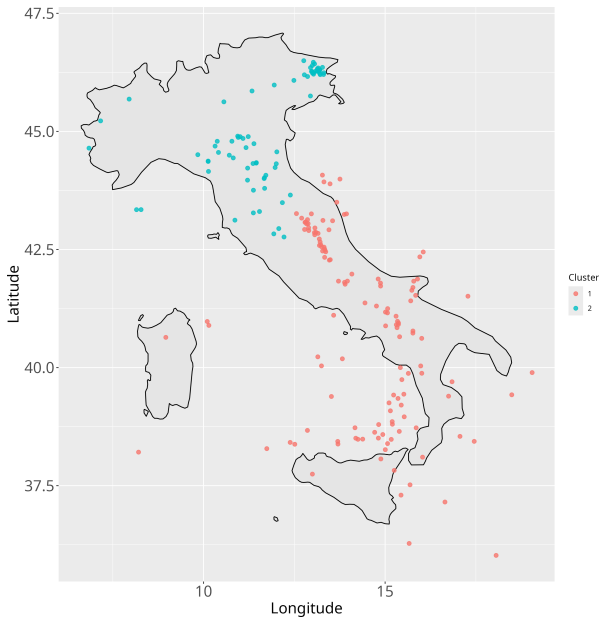
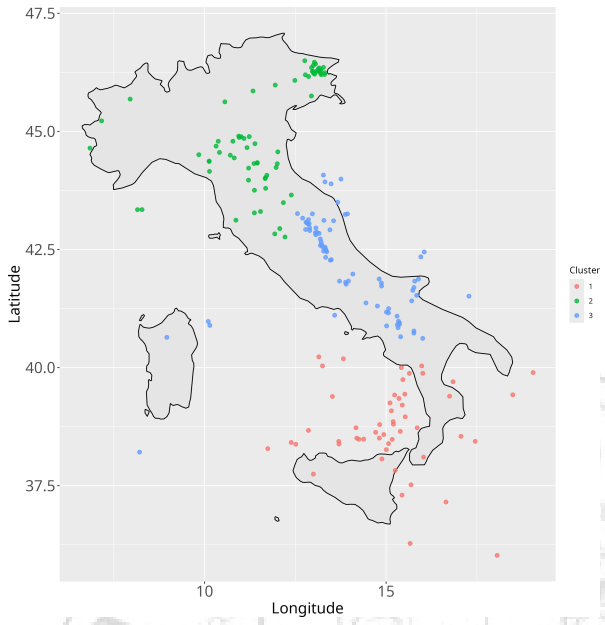
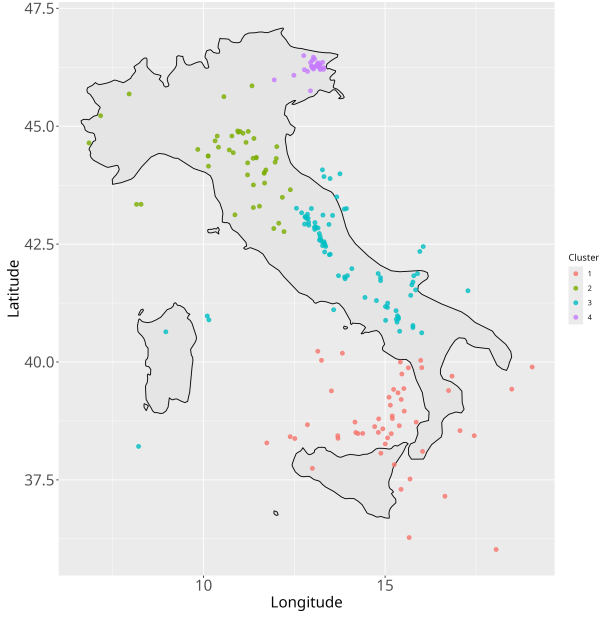
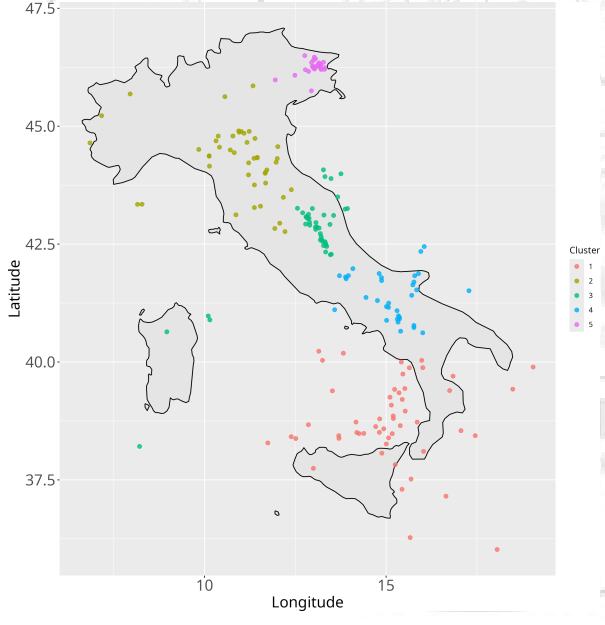


Hierarchical clustering









Thanks for your attention!