

## *Supplement of*

# **Path and site effects deduced from merged transfrontier internet macroseismic data of two recent M4 earthquakes in NW Europe by using a grid cell approach**

*Koen Van Noten et al., Solid Earth, 8, 453-477.*

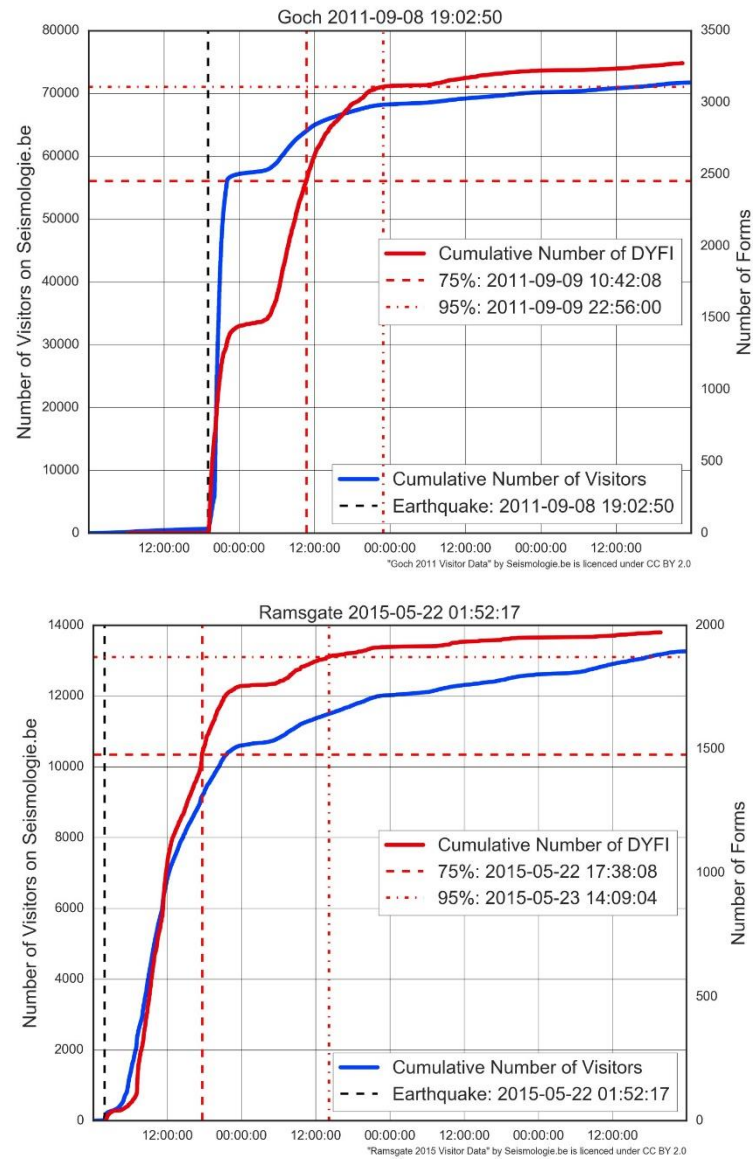
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- The ZIP file provides several **ESRI Shapefiles** that allow to replot the macroseismic intensity maps in Figures 6B and 10.

*Shapefiles:*

1. *Goch Epicentre, Ramsgate Epicentre*: Epicentre location shapefiles of the 2011 Goch and 2015 Ramsgate earthquakes
  2. *Goch grid cell intensity map*: 2011 Goch earthquake grid cell intensity shapefile with number (PNTCNT) of merged responses (NRW-GD not included) in each grid cell and the mean grid cell intensity (CII\_mean) - Figure 6B
  3. *Ramsgate grid cell intensity map*: 2015 Ramsgate earthquake grid cell intensity shapefile with number (PNTCNT) of merged responses (BGS not included) in each grid cell and the mean grid cell intensity (CII\_mean) - Figure 10
  4. *Grid cell intensity color scale QGIS.qml*: QGIS Layer Style File with Intensity Colours. Apply the Layer Style File to the 2011 Goch and 2015 Ramsgate shapefiles in QGIS to colour the grid cell intensity maps in a similar way as in Figures 6B and 10.
  5. *Border Faults LRG*: Lower Rhine Graben border faults
- **Table S1** (*comparison institutional questionnaire.pdf*) compares the different questions in the institutional questionnaires of the 6 institutes used in this study: BGS, ROB-BNS, NRW-GD, BCSF, EMSC & USGS. We checked which questions overlap between the different institutes and which questions are specific for one institute. Most questions are rather similar and ask typical effects concerning the person's situation when the earthquake occurred, the perception and experience of the earthquake and earthquake effects on people, furniture, buildings and the environment. The intensity attenuation relation (IAR) analysis in the paper shows that the intensities derived from the different questionnaires are rather similar. Only the EMSC thumbnails and NRW-GD intensities deviate from the mean IAR.

- **Figure S1** in below shows the evolution in submissions and cumulative number of visitors on the Seismology.be website after the Goch and Ramsgate earthquakes. The timing of 75% and 95% submissions are indicated by the dashed lines

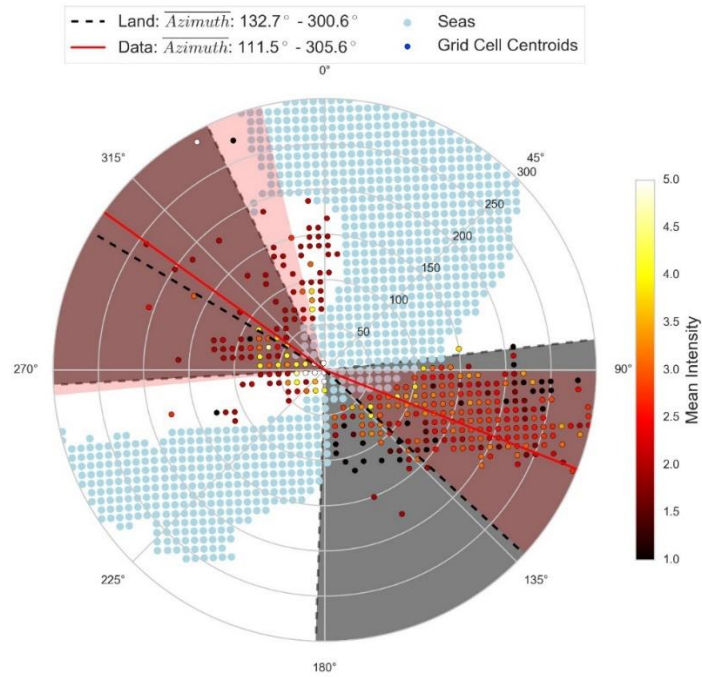


**Figure S1**

- In **Figure S2** the mean azimuthal orientation of the grid cell distribution of the 2015 Ramsgate earthquake is quantified to prove that the distribution is WNW-ESE oriented. The polar plot shows the mean azimuth through all response cells on the continent and in the United Kingdom.

**On the continent**, the mean orientation (red line, brown area =  $\pm 1\sigma$ ) of the felt distribution is  $111.5^\circ$ , corresponding to an ESE orientation with respect to the epicentre. The ESE-oriented felt distribution clearly deviates from the mean azimuth ( $132.7^\circ$ , grey area =  $\pm 1\sigma$ ) derived through all available cells, i.e. the response potential on the continent. This orientation shows that the distribution is not a population, nor an “emerged land vs sea (blue dots)” effect.

**In the UK**, the response distribution is more widespread ( $1\sigma$  between  $260^\circ$  to  $350^\circ$ ) but the azimuthal mean is  $305.6^\circ \sim \text{WNW}$ . This larger spread is likely related to the dispersing occurrence of the Anglo-Brabant Massif in the subsurface (see Fig. 12 in the paper).



**Figure S2.** Blue dots: “No data” cells in the North Sea and English Channel. Coloured cells: mean grid cell intensity data. White area: response potential on land. Brown area:  $\pm 1\sigma$  of the circular mean through the grid cell data. Grey / Pink areas:  $\pm 1\sigma$  of the circular mean through the response potential on the continent / UK.