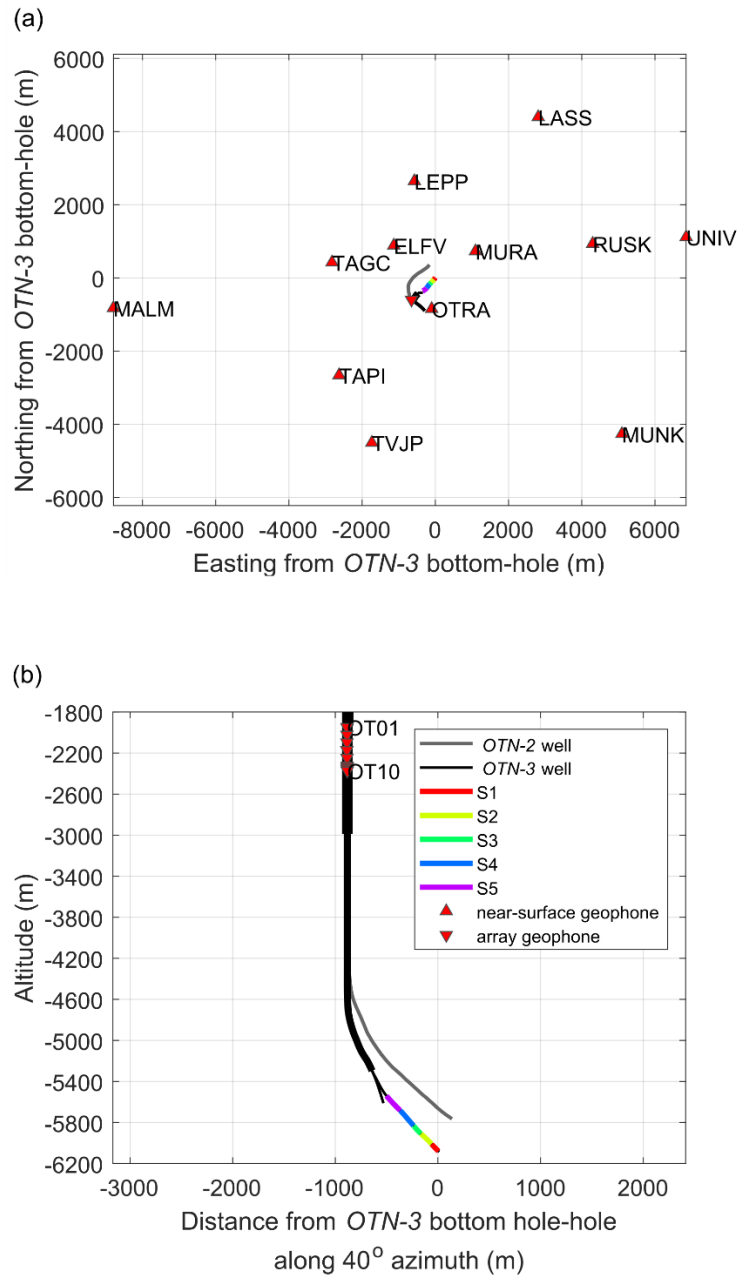# Supplementary Materials for:

Seismicity during and after stimulation of a 6.1 km deep Enhanced Geothermal System in Helsinki, Finland

5

Maria Leonhardt, Grzegorz Kwiatek, Patricia Martínez-Garzón, Marco Bohnhoff, Tero Saarno, Pekka Heikkinen, and Georg Dresen

Figure S1. Seismic network used for monitoring the stimulation in 2018. (a) Map view showing the near-surface geophones framing the EGS site with the injection borehole *OTN-3* and the *OTN-2* well drilled in 2019 and 2020. (b) Side view of the boreholes with the geophone-array placed at the already existing part of the *OTN-2* well. The injection intervals S1-S5 of the stimulation in 2018 are color-coded at the end of the injection borehole. For further details about location of the EGS site at the suburban area of Helsinki in Finland see Kwiatek et al. (2019).
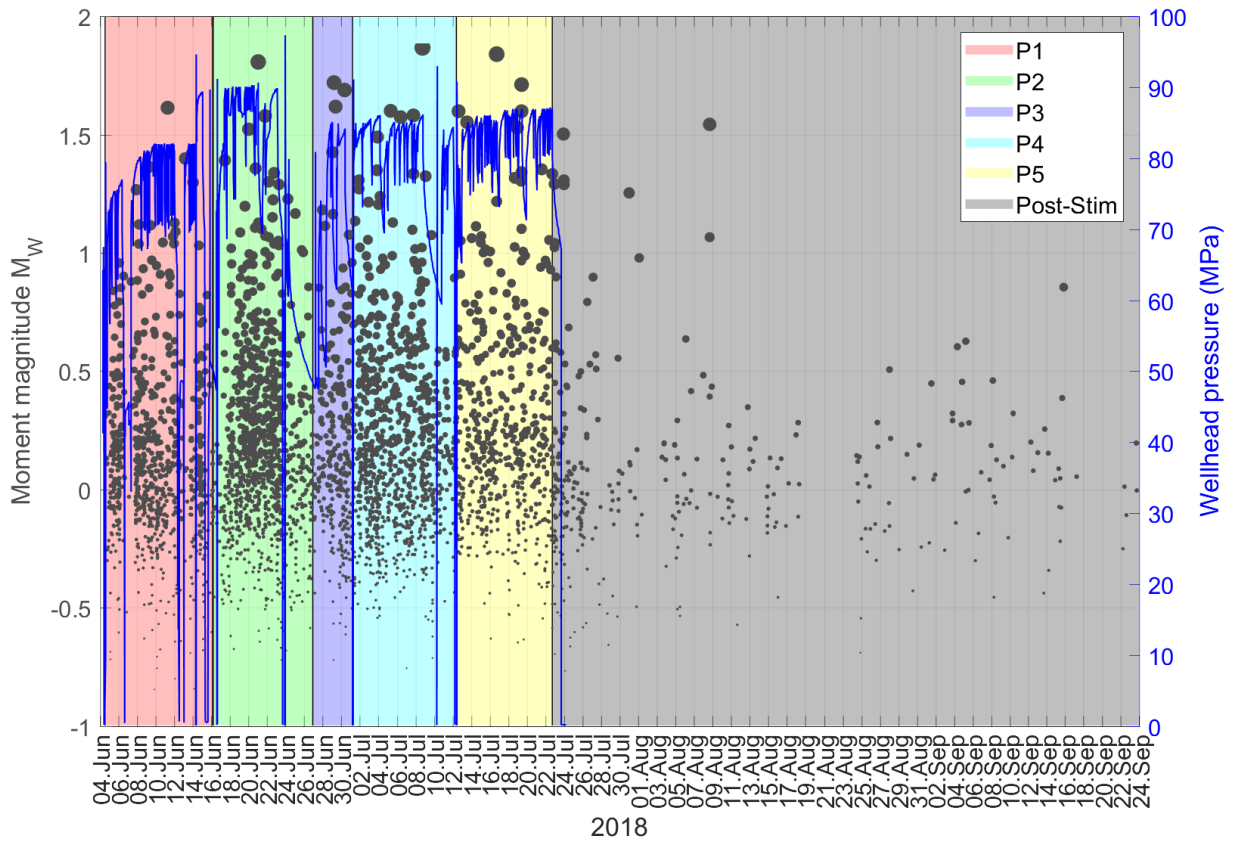
15   **Figure S2. Stimulation protocol with stimulation phases P1-P5 and post-stimulation period. The magnitudes of absolute located events are shown as dark grey dots. The blue solid line presents the wellhead pressure during the stimulation.**
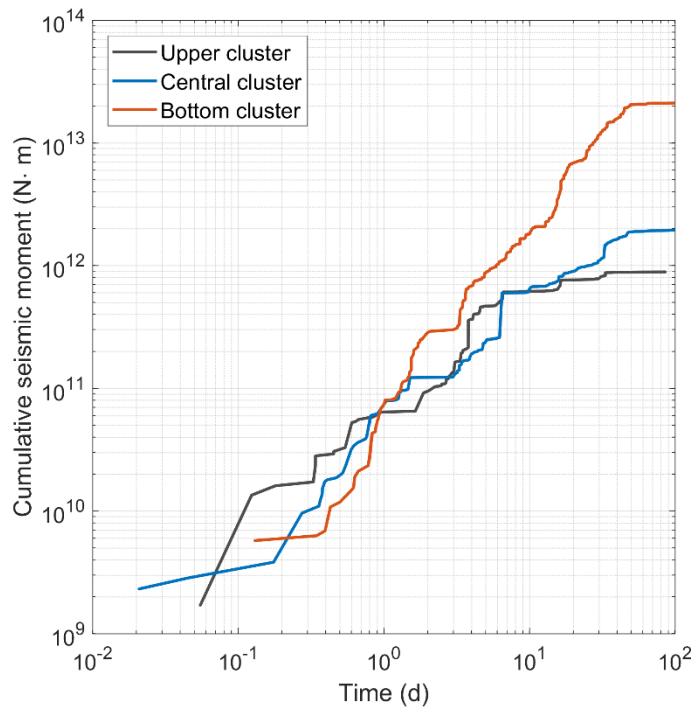
Figure S3. The cumulative seismic moment of each hypocenter cluster considering stimulation as well as post-stimulation times.
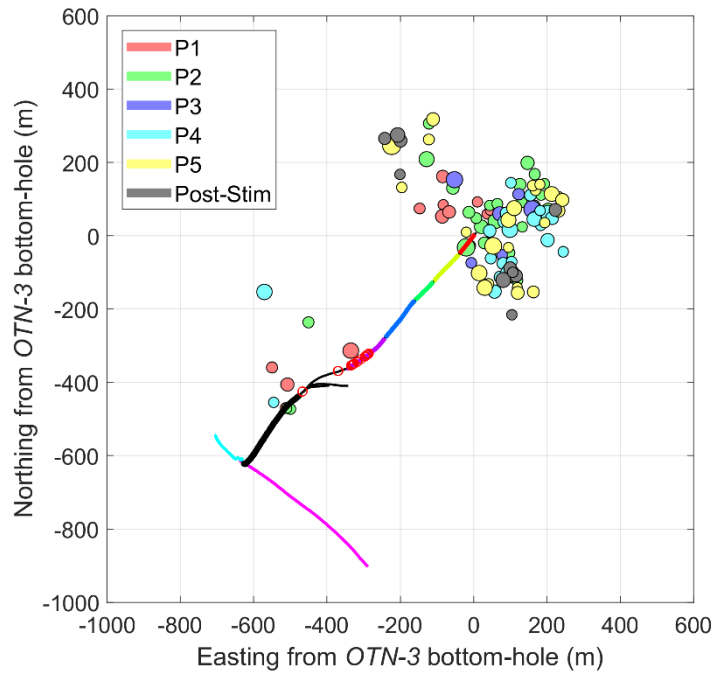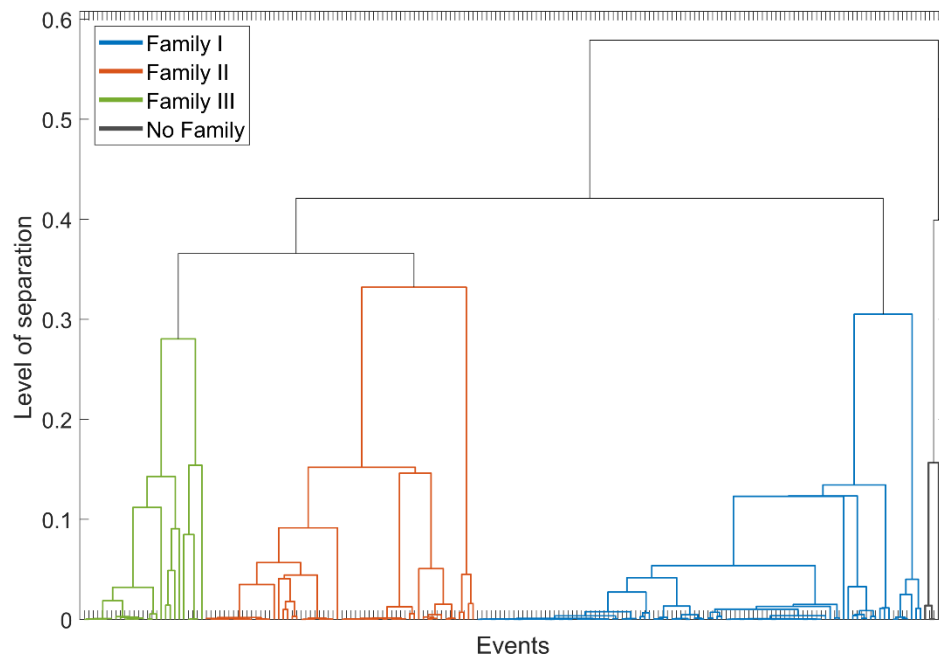
20

Figure S4. Map view of all events with moment magnitude $M_W \geq 1$.

Figure S5. Dendrogram showing separation of FM events into family I-III based on cluster analysis of rotation angles.
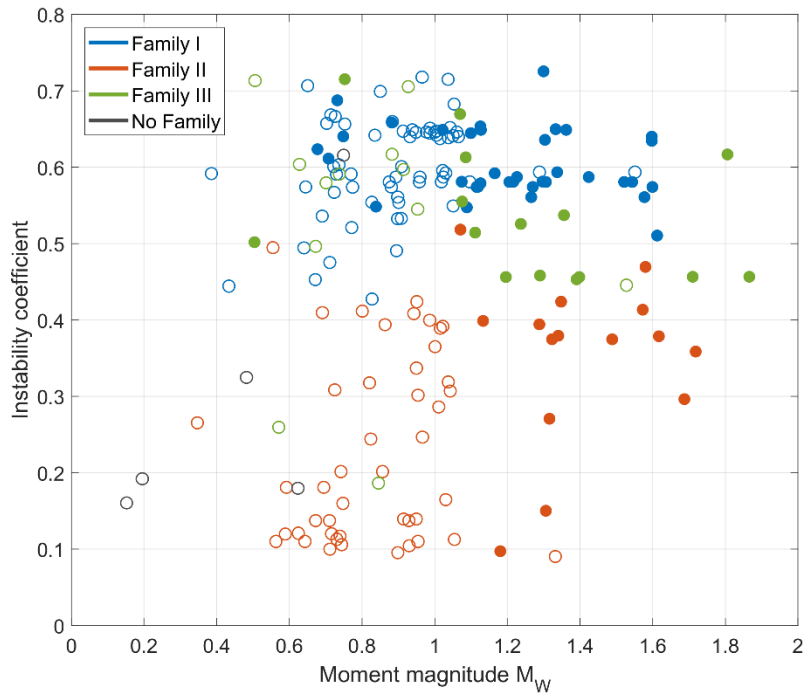
Figure S6. Highest fault instability coefficient of any of the two FPSs for each FM event plotted with moment magnitude. Events with manually picked and estimated polarities are plotted with filled and unfilled circles, respectively.

30

35

40

45 **Table S1. Fault instabilities of mean fault plane solution and its auxiliary plane for each family.**

	Instability of mean fault plane solution	Instability of mean auxiliary fault plane solution
Family I	0.6026	0.3978
Family II	0.1940	0.1629
Family III	0.4103	0.4087