EGU2020-10759
https://doi.org/10.5194/egusphere-egu2020-10759
EGU General Assembly 2020

Thermal energy pattern related with the temperature increasing due to intraplate and induced seismicity, Southern Norway, 2017-2018

Rodrigo Estay
Universidad Técnica Federico Santa María, Departamento de Ingeniería Metalúrgica y de Materiales, Chile (rodrigo.estayh@usm.cl)

Small seismological events recorded in southern Norway in the period of 2017-2018 were used to calculate the sudden co-seismic temperature increase using a simple stress-drop model. In order to estimate the net production of thermal energy, both, industry explosions and natural events were included. The range of resultant average temperature rise, with a maximum of ~ 143 ° C for a M_{w} =3.5, is proposed as an additional constituent that explain the weakness areas related to the high amount of intracrustal seismicity, mainly regarding the anisotropic thermal expansion of rocks and the flash heating thermal process produced by historical earthquakes with magnitudes over . The temperature values were subsequently used to estimate the thermal energy in 2D and 3D cumulative patterns in the area, as well as the total amount of energy that is available regarding seismic activity. The results were correlated with existing geological information, considering lineaments and heat flux data. Areas with high values of thermal energy seems to be spatially linked with both high heat flux zones and high density of lineaments, mainly to the south of the Trøndelag Platform as well as to the south of the Møre basin.