

## **A delayed seismicity burst revealed by template matching approach during stimulation of GRT1, Rittershoffen, Alsace, France**

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The ECOGI joint-venture is developing a deep geothermal project at Rittershoffen, 6 km east of Soultz-sous-Forêts, in Northern Alsace. For this purpose, at the end of 2012, a first well (GRT1) was drilled to 2580 m depth through Triassic-sediments and into the crystalline basement. In order to enhance the reservoir permeability, a hydraulic stimulation was performed in the GRT1 well in June 2013. The hydraulic stimulation in GRT1 lasted 2 days (27 and 28 June 2013) and was recorded by a dedicated seismic network. The seismic activity related to the GRT1 hydraulic stimulation was processed in real-time and gave rise to a first seismicity catalogue composed of a total of 212 events, from the 27 of June to the 4th of July 2013. The catalogue reveals that the seismicity stopped shortly after injection, but started again after 4 completely quiet days on July 2nd, in the form of an intense seismic swarm that lasted less than one day. In order to understand how this second crisis developed several days after the injection stopped we apply a dedicated set of tools to recover and locate the most precisely as possible the earthquakes that occurred during this sequence. We are able to detect and locate precisely 1393 events. We show that these events that occurred during the injection define a planar structure where we observe migration of the seismicity. Based on our precise relocations we can also identify that the events of the second crisis occurred on a different structure probably activated by slow aseismic movements.