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# Geophysical insights on the distribution of monogenetic volcanoes in the Garrotxa volcanic field

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The Garrotxa Volcanic Field (northern Spain) is part of the Catalan Volcanic Zone, of the Quaternary volcanic provinces associated with the European rift system. It contains the most recent and better preserved volcanic edifices of the Catalan Volcanic Zone, with 38 monogenetic volcanoes identified in the Garrotxa Natural Park. As in many other monogenetic volcanic zones, the geological structure of the substrate, especially its hydrogeological features, has been crucial to determine the eruptive mechanisms, in the Garrotxa Volcanic Field. Geophysical exploration, including gravimetry and self-potential, has been used to improve the knowledge about the relationships between local geological and, more specifically, structural context and the spatial distribution of the monogenetic volcanoes in this area. The main finding of the study is that the central part of the volcanic field is underlain by low density material, which partly can be interpreted as the root of surface manifestations of volcanic activity. We find a low density body just NW of the Croscat volcano, the youngest volcano of this zone, as the dominant low density feature in the area, where preferential ground water infiltration along a fault or fissure have also been identified from our self-potential measurements. Both gravimetry and self-potential acquired in our study show that volcanism appears to be controlled by NE-SW and NW-SE tectonic structures roughly perpendicular to the main structural limits bounding the study area to north and south. Results from this study and data modelling in addition with geological and other geophysical data will shed light on the current state of the volcanic zone. A major future outcome of this joint effort is to assess the potential for volcanic reactivation of the area with major implications for the geodynamic understanding of this zone, which until now lacks detailed geophysical data to support decision–making processes for disaster preparedness and response.