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Geochemical and geophysical monitoring activities in Campo de Calatrava Volcanic Field (Spain)

Natividad Luengo-Oroz (1), Víctor Villasante-Marcos (2), Rubén López-Díaz (2), Marta Calvo (2), Helena Albert (3), and Itahiza Domínguez Cerdeña (1)

(1) Centro Geofísico de Canarias, Instituto Geográfico Nacional. Santa Cruz de Tenerife, Spain. (nluengo@fomento.es), (2) Observatorio Geofísico Central, Instituto Geográfico Nacional. Madrid, Spain., (3) Earth Observatory of Singapore, NTU. Singapore.

The Campo de Calatrava Volcanic Field (CCVF) or Spanish Central Volcanic Zone is located in central continental Spain (Ciudad Real province) and covers about 5000 km^2. It includes around 240 eruptive centers, mainly monogenetic basaltic cones but also explosive maar structures. According to K-Ar geochronology, its main activity phase occurred during Pliocene and Pleistocene epochs (between 5 and 1.7 Ma) and involved alkaline to ultraalkaline magmas, although an older ultrapotassic phase is dated around 8.7-6.4 Ma. However, some recent works have proposed Holocene ages for some of the volcanic products, opening the possibility of considering the CCVF "active" according to international standards.

Responding to this situation, the Instituto Geográfico Nacional (IGN) has initiated geochemical and geophysical monitoring activities in the CCVF. Here, we describe these ongoing efforts and we report results about groundwater geochemistry at several natural highly-gaseous springs in the area (*hervideros*), as well as soil temperature, CO_2 diffuse flux from the soil and electrical self-potential data mapped on a small degassing structure called La Sima. In order to analyze microseismicity or any seismic anomaly in the CCVF, a seismic station has also been installed close to this degassing structure.

Physicochemical parameters (temperature, pH, Eh and electric conductivity) were measured *in situ* in four springs and samples were taken in order to analyze major ions and trace elements. Total composition of dissolved gases and helium isotopic ratios were also determined.

To complete soil temperature, self-potential and gas prospections performed in La Sima, soil gases were sampled at the bottom of the structure at a depth of 20 cm. Analysis of the total gas composition found 957400 ppm of CO_2. Low values of O_2 and N_2 were also detected (5600 and 24800 ppm respectively).