

Gas monitoring and detection of microseismicity in the volcanic system of Campo de Calatrava, European intracontinental volcanism (Spain)

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1. INTRODUCTION.

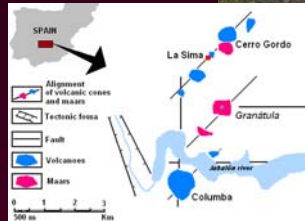
In the Campo de Calatrava for 8 million years to the middle Holocene has developed an eruptive activity organized in cycles or stages (Ancochea, 1983, Poblete, 1993) separated by long periods of calm. At present there is a residual activity characterized by diffuse emission of magmatic gas between predominantly CO₂ whose origin could be an important degassing of a deep magmatic body, and its arrival to the surface be related to the fracture system affecting the Paleozoic basement (Calvo *et al*, 2010).



Hot spring whit CO₂ degassing



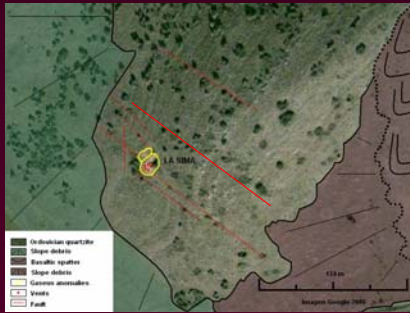
Vent of La Sima



2. FIRST FIELDWORK

In August 2007, and within the project VOLATMCO₂, researchers of ITER (Canary Islands), conducted a first evaluation of the diffuse emission of gases, which continued in 2008. The results highlighted the need to carry out continuous monitoring of gases that would evaluate in more detail its origin and value of emissions.

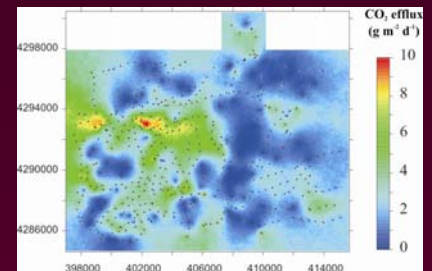
In September 2007, a gas geochemistry field work was performed to evaluate the spatial distribution of CO₂ efflux and estimate the total CO₂ output from the three surveyed areas. Results show the existence of an endogenous fraction in the CO₂ emitted in a diffuse form.



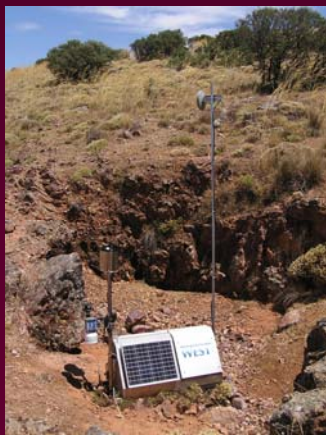
La Sima vents



Degassing vents in La Sima



Spatial distribution of the diffuse flux of CO₂ in the sector of La Sima. Campo de Calatrava (Calvo *et al*, 2010)



Geochemical station and seismograph installed on La Sima

3. CURRENT PROJECTS

To do so, within the scope of the research project entitled: Evaluation of the emission of CO₂ in the volcanic system of the Campo de Calatrava. The gas vent of La Sima, in May 2009 we proceeded with the installation, in the area that have been detected major gaseous emissions - vents of La Sima- of a geochemistry station in continuous mode for the detection of CO₂ and H₂S. The increase in the emission of CO₂ and radon, coincident with the detection of earthquakes located in areas close to the volcanic region, has led to the signing of a cooperation agreement between the University of Castilla-La Mancha (UCLM) and the National Geographic Institute (IGN) by which it is proceeding with the installation of a seismic network to detect in the area a possible microseismicity. This will enable progress in the understanding of the current behavior of the volcanic system of the Campo de Calatrava, and its relationship to other systems belonging to the European intracontinental volcanism.

4. CONCLUSION

In the Campo de Calatrava is recorded at least a phreatomagmatic eruption in the middle Holocene. Since the sixteenth century and to date is clearly the presence of thermal and gaseous anomalies in La Sima. This has necessitated the installation of instrumentations of monitoring areas in which the gas emission, linked to calatrava volcanism, is more intense. In June 2009 and February 2010 starts receiving data of gas emissions and microseismicity. Today is proceeding to complete the installation of the seismic network.



REFERENCES

Calvo *et al*. (2010): Emisión Difusa de CO₂ en el Campo de Calatrava, Ciudad Real. En: *Aportaciones recientes en Volcanología 2005-2008*. Centros de estudios Calatravos. Almagro, 2010