

Infrastructure

The [Spanish Research Council \(CSIC\)](#) is the largest public multidisciplinary research organisation in Spain (114 Institutes, > 2,700 scientists, 2400 pre- and post-doctoral researchers).

The [Institute of Earth Sciences Jaume Almera \(ICTJA\)](#) is one of the three institutes dedicated to advance the understanding of Earth System Science.

The [Group of Volcanology of Barcelona \(GVB\)](#) was created in 1990 and since then has focused on the study of volcanic processes and volcanic risk assessment and management.



Location of the ICTJA (Barcelona, Spain)



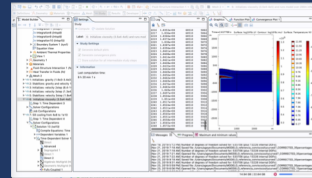
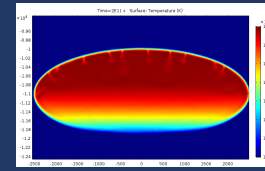
ICTJA building (Barcelona, Spain)

Physical access to on-site modelling resources

On-site access to modelling resources, including initial training, guidelines and technical assistance to simulate with the FEM modelling software COMSOL Multiphysics: (i) thermo-fluid dynamic processes occurring during the phases of magma injection, accumulation and cooling and (ii) local and regional stress field of volcanic areas.

The on-site access has been complemented with further remote assistance to the users to help finishing their research work.

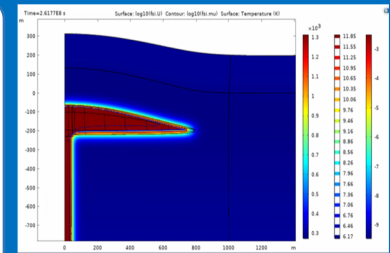
Examples of simulations of magma chambers with COMSOL Multiphysics



Funded project: MAGMAGROW

Objective: Simulate the deformation of the reservoir induced by magma flowing and cooling in order to understand the evolution of magma reservoirs, how magma flows, transports and transfers heat while accumulating into a growing reservoir surrounded by elastic host-rock.

Results contribute to the understanding of volcanic activity and associated hazards and production of geothermal energy.



Screenshot of the simulation of magma intruding and cooling into a growing laccolith obtained with COMSOL Multiphysics

EUROVOLC TRANSNATIONAL ACCESS

European Network of Observatories and Research Infrastructures for Volcanology

Within the framework of the EUROVOLC project, the GVB-ICTJA has offered:

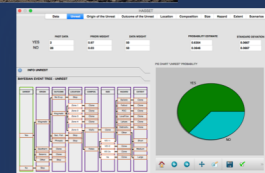
Physical access to on-site hazard assessment tools

On-site access to VOLCANBOX (<http://www.volcanbox.eu>), an e-tool that integrates in a systematic and sequential way a series of well-tested tools, addressing various aspects of the volcanic hazard processes and risk assessment.

VOLCANBOX users can apply probabilistic methods to assess and forecast volcanic eruptions and hazards, as well as their spatial and temporal likelihood of occurrence.

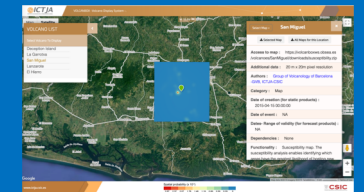


Screenshots of the VOLCANBOX e-tool



Funded project: e-THA

Objective: Volcanic hazard assessment at San Miguel Volcano (El Salvador). Using the long-term hazard assessment at San Miguel, the project has successfully incorporated the monitoring data (1995 – 2018) and has processed it using Bayesian Inference and HASSET tool Short-Term, both tools included in VOLCANBOX.



Screenshots of the susceptibility map for San Miguel volcano obtained with VOLCANBOX.

Acknowledgements:

These activities were funded by the EUROVOLC project (Horizon 2020 Grant Agreement: 731070).