

Sébastien Valade

Institution: UNAM (National Autonomous University of Mexico), Institute of Geophysics (dept. of Volcanology)

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Date of birth: 1985/10/31

Education

- 2012 **Ph.D.** in Earth Sciences, speciality volcanology/geophysics
Institution: University Clermont-Auvergne (Laboratoire Magmas et Volcans, [LMV](#)), France
Thesis: *Source mechanisms and dynamics of volcanic pyroclastic emissions: a perspective from Doppler radar (VOLDORAD) and other geophysical data* ([online access](#))
- 2008 **Masters of Science degree**, speciality “Magmas and Volcanoes” ([LMV-INVOGE](#))
Institution: University Clermont-Auvergne (Laboratoire Magmas et Volcans, [LMV](#)), France
Thesis: *Doppler radar study of Popocatepetl (Mexico) ash plumes: first insights into the long-term monitoring of explosive volcanoes with the VOLDORAD*
- 2008 **Engineering degree** (masters degree level) in geosciences
Institution: Institut Polytechnique UniLaSalle ([UniLasalle](#)), France
- 2007 **Bachelor of Science** in Geology
Institution: Institut Géologique Albert-Lapparent (IGAL, now [UniLasalle](#)), France
Thesis: *Petro-stratigraphic and tectonic study of the northern flank of the Valle del Bove, Etna (Sicily, Italy)*

Professional Appointments

- since 2020/03 **Research Associate**
2 years
Institution: National Autonomous University of Mexico (UNAM), [Institute of Geophysics](#), Dept. Volcanology, Mexico
- 2019 **PostDoc. fellow**
6 months
Institution: GeoForschungsZentrum (GFZ) Potsdam, [Volcano Hazards Team](#), Germany
Project: “*MOUNTS-AI: Artificial Intelligence in support of Volcano Monitoring*”
Grant: [Geo.X seed funding](#) (Research Network for Geosciences in Berlin and Potsdam)
- 2017-2019 **PostDoc. fellow**
2 years
Institutions: Technischen Universität Berlin (TU-Berlin), Computer Vision and Remote Sensing dpt. ([CV](#)) & GeoForschungsZentrum (GFZ) Potsdam, [Volcano Hazards Team](#), Germany
Project: “*MOUNTS: Monitoring Unrest from Space*” (www.mounts-project.com)
Grant: [Geo.X](#) (Research Network for Geosciences in Berlin and Potsdam)
- 2013-2017 **PostDoc. fellow**
4 years
Institution: University of Firenze UNIFI (Laboratorio di Geofisica Sperimentale, [LGS](#)), Italy
Tasks: geophysical monitoring of Stromboli/Etna for Italian Civil Defense; responsible for installation/management of monitoring cameras (IR/VIS) at Etna
- 2012-2013 **PostDoc. fellow**
1 year
Institution: University Blaise Pascal UBP (now University Clermont-Auvergne UCA), France
Project: infrared thermal imagery of volcanic ash plumes
- 2008-2011 **Ph.D. fellow**
3 years
Institution: University Blaise Pascal UBP (now University Clermont-Auvergne UCA), France
Project: “*Pyroclastic emission dynamics and source mechanisms with multi-parametric geophysical data*”

Financed research projects (as Principal Investigator PI)

2021-2023 2 years	PAPIIT Title: <i>“Linking space and ground-based observations for better understanding and prediction of eruptive crises”</i> Funding: <i>UNAM Funding Programme for Research and Technological Innovation Projects</i> (link)
2019 6 months	GEO.X Seed Funding Title: <i>“MOUNTS-AI: Artificial Intelligence in support of Volcano Monitoring”</i> Funding: <i>Geo.X (Research Network for Geosciences in Berlin and Potsdam)</i>
2017-2019 2 years	GEO.X Title: <i>“MOUNTS: Monitoring Unrest from Space”</i> Funding: <i>Geo.X (Research Network for Geosciences in Berlin and Potsdam)</i>
2012 2 weeks	MEMOVOLC young researcher grant Title: <i>“MODAPLUME: Model and Data for Plumes”</i> Funding: <i>MEMOVOLC european grant</i>

Collaboration in research projects (as collaborator)

2022 2 years	UNAM-PAPIIT (submitted, currently under review) Title: <i>“Clasificación y procesos de formación de los lagos de lava”</i> P.I.: <i>R. Campion (UNAM, Mexico)</i>
2021 2 years	GEO-GSNL Permanent Supersites Title: <i>“Virunga Volcanoes Supersite: 2020-2021”</i> (biennial report) P.I.: <i>C. Balagizi (GVO, D.R.Congo)</i>
2013-2017 4 years	UNIFI-DPC Title: <i>“Sviluppo della conoscenza e di metodi utili alla valutazione degli scenari di pericolosità connessi con la dinamica dei vulcani esplosivi, attraverso una rete di monitoraggio multiparametrico e loro correlazione con la velocità dei fenomeni gravitativi di versante”</i> P.I.: <i>M. Ripepe (UNIFI, Italy)</i>

Research stays at foreign research centres

2021/2022 2 months	University of Torino, Turin (Italy), Prof. D. Coppola Project: <i>“Combined data processing from MOUNTS & MIROVA volcano monitoring platforms”</i> Funding: <i>Academic exchange grant (UNAM)</i>
2008 3 months	University of Costa Rica, San José (Costa Rica), Prof. M. Mora Project: <i>“Development of MATLAB-based software for analysis of radar and seismic data”</i> Funding: <i>Prof. M. Mora</i>
2006 4 months	Massey University, Palmerston North (New Zealand), Prof. J. Lecointre Project: <i>“Analogue modelling of clay-rich debris flows”</i> Funding: <i>EGIDE grant (French Ministry of Foreign Affairs)</i>

Professional experience

Research activity

My research interests focus on the study of volcanic eruptive processes, using (1) multiparametric geophysical & remote sensing monitoring, (2) numerical modelling, and (3) volcanic hazard assessment.

1. integrated monitoring

I use both ground-based (infrared/optical imagery, infrasound, seismic, Doppler radar) and space-borne (radar, infrared, UV) remote sensing techniques to study eruptive processes.

In particular, I am the founder and developer of the volcano monitoring platform **MOUNTS** (www.mounts-project.com, [15]), which exploits multi-sensor satellite data (Sentinel-1, Sentinel-2, Sentinel-5P) and artificial intelligence (Deep Learning) to recover key parameters informing on the volcanic activity of >70 active volcanoes worldwide in near-real-time. This unique integration between different sensors allows for a comprehensive understanding of the volcanic process, useful to both the research and operational communities. The platform is used daily by several volcano monitoring agencies, and delivers automatic email alerts on key volcanic parameters (i.e., ground deformation, thermal anomalies, gas emissions). The collected datasets feed my research on the study of various eruptive styles worldwide. Alongside, I regularly participate to scientific geophysical data acquisition campaigns in various volcanoes worldwide.

2. numerical modelling

I develop forward numerical models to reproduce source processes and synthetic geophysical signals, and use inverse modelling to constrain input parameters and subsequent source parameters.

In particular, I modelled the ballistic projections produced by strombolian explosions, and simulated the synthetic radar signal measured with a Doppler radar [32], in order to explain the internal dynamics of these pyroclastic emissions.

3. hazard assessment

I develop algorithms dedicated to volcanic hazard assessment through multi-parameter monitoring of active volcanoes.

In particular, from 2013 to 2017 I participated in the geophysical surveillance of the volcanoes Etna and Stromboli, as part of a contract between the University of Firenze and the Italian Civil Protection. This involved the design and installation of instrumentation, automation of algorithms for real-time data transmission, acquisition, processing, definition of automatic alert thresholds, web publication of results and communication with decision-making authorities during eruptive crises. I contributed from 2013 to 2017 to the drafting of the daily volcanic activity reports of Stromboli and Etna volcanoes, as well as to the scientific consulting for authorities during eruptive crisis.

Teaching activity

Lectures

2021	Creator and responsible of the lecture “ Computer Vision for geosciences: from classical methods to modern approaches using Deep Learning ” Institution: <i>National Autonomous University of Mexico (UNAM)</i> Hours per semester: <i>64 (8 credits ECTS)</i>
2019	Participation to the International School of Volcanology : “Working on an active volcano: learning the tools of modern volcanology (Field measurements, instruments, data acquisition and processing)” Lecture given: <i>Ground deformation from satellites</i> Date/Place: <i>15-22 June 2019, Stromboli (Italy)</i> , link Hours: <i>1</i>
2017	Participation to the International Training Course : “Seismology, Seismic Data Analysis, Hazard Assessment and Risk Mitigation” (<i>organised annually by GFZ, part of the UNESCO programme</i>)

Lecture given: *InSAR Processing with SNAP*

Date/Place: 4-29 Sept. 2017, Potsdam (Germany), [link](#)

Hours: 3

2013 Participation to the lecture **Volcanic systems and risks** (master level, main lecturer Prof. A. Harris, Master: “Magmas et Volcans”, University Blaise Pascal, Clermont-Ferrand, France)

Lecture given: *Explosive Eruption Plume Dynamics*

Date/Place: 2013/02/26, Clermont-Ferrand (France)

Hours: 3

2010 Participation to the “Science of the Earth and Universe” university program (bachelor level 2° year, University Blaise Pascal, Clermont-Ferrand, France)

Lecture given: *Introduction to maps and geological sections*

Date/Place: 2010/04/06, Clermont-Ferrand (France)

Hours: 6

2009 Participation to the “Science of the Earth and Universe” university program (bachelor level 1° year, University Blaise Pascal, Clermont-Ferrand, France)

Lecture given: *Methodology of academic research work*

Date/Place: Sept.-Oct. 2009, Clermont-Ferrand (France)

Hours: 15

2009 Supervisor of geological mapping excursions in a volcanic environment, with students of the 2° year of the engineering school of geosciences (Institut Polytechnique LaSalle)

Date/Place: 19 May - 02 June 2007, Massif Central (France)

Hours: >140

Students (selection, master thesis only)

2022 (ongoing) Balazs Markus, *Improve automatic detection of volcanic gas clouds from satellite imagery*; Degree: Master of Science; Institution: Technische Universität Berlin (Germany); Directors: S. Valade, M. Wollhaf

2013 Anthony Lamur, *Eruption dynamics of Fuego volcano (Guatemala): a comparative study of seismic, acoustic and thermal signals*; Degree: Master of Science; Institution: University Blaise Pascal (France); Directors: G. Waite; B. Van Wyk de Vries; S. Valade

Scientific campaigns for geophysical & geological data acquisition

2022 (3 days) **Colima** (Mexico) – assistance in in-situ gas sampling inside the crater

2021 (1 week) **Pacaya** (Guatemala) – assistance in UV camera, drone, and multigas recordings

2020 (5 days) **Popocatepetl** (Messico) – assistance in multigas recordings

2018 (4 weeks) **Bezymianny, Karymsky** (Russia) – drone, time-lapse, seismic & tilt

2017 - 2013 **Etna, Stromboli** (Italy) – maintenance of large geophysical monitoring network [\[23\]](#)[\[24\]](#)[\[20\]](#)[\[18\]](#)[\[11\]](#)

2016 (2 weeks) **Nyiragongo, Nyamulagira** (RDC) – infrasonic array and infrared camera [\[19\]](#)

2015 (2 weeks) **Piton de la Fournaise** (Reunion Island) – infrasonic array and infrared camera

2014 (4 weeks) **Stromboli** (Italy) – scientific consultant during 2014 effusive crisis [\[23\]](#)

2013 (2 weeks) **Sakurajima** (Japan) – infrared and UV cameras

2012 (3 weeks) **Lastarria, Lascar** (Chile) – infrared and UV cameras [\[13\]](#)[\[26\]](#)

2012 (2 weeks) **Stromboli** (Italy) – multidisciplinary geophysical experiment (radar, IR, UV, VIS) [\[28\]](#)

2009 (2 weeks) **Arenal** (Costa Rica) – Doppler radar [\[32\]](#)

2009 (1 weeks) **Etna** (Italy) – Doppler radar (voldorad 2B) permanent installation [\[22\]](#)

2009 (2 weeks) **Villarica, Llaima** (Chile) – broadband seismometers

2007 (2 weeks) **Sancy** (France) – supervisor of geological mapping field trip (undergrad students)

2005 (4 weeks) **Etna** (Italy) – petro-stratigraphic study of the north flank of Valle del Bove

2004 (4 weeks) **Etna** (Italy) – flank eruption study (September 2004), field mapping & 3D quarry map

Services to the community

2021/04/26	chairman/co-convenor of the EGU 2021 session “ <i>Long-term observation of volcanic degassing: methods, findings and challenges</i> ”
2012 - today	reviewer for scientific publications (Geology, GRL)
2010 - 2011	member of the scientific advisory council of the observatory OPGC
2009 - 2010	member of the administrative advisory council of the observatory OPGC

Skills

Scientific

integrated geophysical monitoring, satellite remote sensing, numerical modelling, study of eruptive processes, quantification of volcanic hazard, deep learning

Computer

programming (Python, Matlab, Shell), software engineering with distributed version control (Git), fullstack web developer, Linux server management, database management (SQL Data Base, Wave Servers Earthworm / SeisCompP), vector graphics editor(Inkscape), tools dedicated to remote sensing (SNAP, GEE Google Earth Engine), L^AT_EX

Language

French (*native*), English (*fluent*), Italian (*fluent*), Spanish (*good*), German (*basic*)

Technical

know-how to operate real-time multiparametric monitoring network: design and installation of instrumentation, data transmission/acquisition/processing/archiving and web publishing, communication with authorities

Awards / Academic distinctions

- | | |
|------|--|
| 2019 | Publication Valade et al. 2019 [15] amongst the “highly cited paper” of <i>Remote Sensing</i> (statistics from the Editorial Special Issue “Remote Sensing of Volcanic Processes and Risk”: link) |
| 2018 | Geo.X hackathon 1° prize (link) |

Media outreach

- Interest for the publication Valade et al. (2019) [15]: (selection)
[National Geographic](#), [Prevention Web](#), [Science Daily](#), [Il Fatto Quotidiano](#), [Eureka Alert](#), [Golem](#), [Künstlicher Intelligenz](#), [GFZ](#), [TU-Berlin](#), [UN-Spider](#)
- Use of the volcano monitoring system MOUNTS (www.mounts-project.com):
~ 4.1k visitors in 2021, regular users from >20 countries
~ 5-10 institutions responsible for volcano monitoring use the data for official communications (*e.g.* [IG-EPN Ecuador 2019+2020](#), [INSIVUMEH Guatemala 2019](#), [CENAPRED Mexico 2020](#), [INGEMMET Peru 2020](#))
+ social networks (Twitter account [@MountsSystem](#)) and specialized blogs ([Earth of Fire](#))
- Documentary (Arte) – “Les arpenteurs de la Terre”, 12 dicembre 2018, [link](#)
- University Press – “Geo-Data-Science Projects & Geo.X network”, [GFZ-Journal](#), [System Erde](#) (2018)
- Cover image – GRL journal cover, (Volume 38, Issue 22), 28 Nov. 2011
- University Press – “Testing behaviour of clay-laden lahar”, [Massey News](#), Issue 20, Nov. 2006, [link](#)

Bibliometrics (updated 2022/08/01)

	H-index	N.publications	N.citations
Scopus profile :	15	31	552
Google Scholar profile :	15	31	695
Research Gate profile :	16	-	669
ORCID 0000-0002-6687-7302			

Publications (peer-reviewed)

- [1] G. Boudoire, S. Calabrese, A. Colacicco, P. Sordini, P. Habakaramo Macumu, V. Rafflin, **S. Valade**, T. Mweze, J.-C. Kazadi Mwepu, F. Safari Habari, T. Amani Kahamire, Y. Mumbere Mutima, J.-C. Ngaruye, A. Tuyishime, A. Tumaini Sadiki, G. Mavonga Tuluka, M. Mapendano Yalire, E.-D. Kets, F. Grassa, W. D'Alessandro, S. Caliro, F. Rufino, and D. Tedesco, "Scientific response to the 2021 eruption of nyiragongo based on the implementation of a participatory monitoring system," *Scientific Reports*, vol. 12, no. 1, p. 7488, 2022. DOI: [10.1038/s41598-022-11149-0](https://doi.org/10.1038/s41598-022-11149-0).
- [2] T. Boulesteix, D. Legrand, N. Taquet, D. Coppola, M. Laiolo, **S. Valade**, F. Massimetti, G. Caballero-Jiménez, and R. Champion, "Modulation of popocatepetl's activity by regional and worldwide earthquakes," *Bulletin of Volcanology*, vol. 84, no. 8, p. 80, 2022. DOI: [10.1007/s00445-022-01584-2](https://doi.org/10.1007/s00445-022-01584-2).
- [3] D. Coppola, **S. Valade**, P. Masias, M. Laiolo, F. Massimetti, A. Campus, R. Aguilar, R. Anccasi, F. Apaza, B. Ccallata, C. Cigolini, L. F. Cruz, A. Finizola, K. Gonzales, O. Macedo, R. Miranda, M. Ortega, R. Paxi, E. Taïpe, and D. Valdivia, "Shallow magma convection evidenced by excess degassing and thermal radiation during the dome-forming sabancaya eruption (2012–2020)," *Bulletin of Volcanology*, vol. 84, no. 2, 2022. DOI: [10.1007/s00445-022-01523-1](https://doi.org/10.1007/s00445-022-01523-1).
- [4] M. Gouhier, V. Pinel, J. Belart, M. De Michele, C. Proy, C. Tinel, E. Berthier, Y. Guéhenneux, M. Gudmundsson, B. Óskarsson, S. Gremion, D. Raucoules, **S. Valade**, and F. Massimetti, "Cnes-esa satellite contribution to the operational monitoring of volcanic activity: The 2021 icelandic eruption of mt. fagradalsfjall," *Journal of Applied Volcanology*, 2022 (in press).
- [5] S. Hidalgo, F. Vasconez, J. Battaglia, P. Espín, **S. Valade**, M.-F. Naranjo, R. Champion, J. Salgado, M. Córdova, M. Almeida, S. Hernández, G. Pino, A. Bell, P. Mothes, and M. Ruiz, "Sangay volcano (ecuador): The opening of two new vents, a drumbeat seismic sequence and a new lava flow in late 2021," *Volcanica*, 2022 accepted with revision).
- [6] F. J. Vasconez, S. Hidalgo, J. Battaglia, S. Hernandez, B. Bernard, D. Coppola, **S. Valade**, P. Ramón, S. Arellano, C. Liorzou, M. Almeida, M. Ortíz, J. Córdova, and A. Vásconez Müller, "Linking ground-based data and satellite monitoring to understand the last two decades of eruptive activity at sangay volcano, ecuador," *Bulletin of Volcanology*, vol. 84, no. 5, p. 49, 2022. DOI: [10.1007/s00445-022-01560-w](https://doi.org/10.1007/s00445-022-01560-w).
- [7] P.-Y. Burgi, **S. Valade**, D. Coppola, G. Boudoire, G. Mavonga, F. Rufino, and D. Tedesco, "Unconventional filling dynamics of a pit crater," *Earth and Planetary Science Letters*, vol. 576, p. 117 230, 2021. DOI: <https://doi.org/10.1016/j.epsl.2021.117230>.
- [8] M. Ripepe, D. D. Donne, D. Legrand, **S. Valade**, and G. Lacanna, "Magma pressure discharge induces very long period seismicity," *Scientific Reports*, vol. 11, no. 1, 2021. DOI: [10.1038/s41598-021-99513-4](https://doi.org/10.1038/s41598-021-99513-4).
- [9] S. Sugimura, T. Nishimura, G. Lacanna, D. Legrand, **S. Valade**, and M. Ripepe, "Seismic source migration during strombolian eruptions inferred by very-near-field broadband seismic network," *Journal of Geophysical Research: Solid Earth*, vol. 126, no. 12, e2021JB022623, 2021. DOI: <https://doi.org/10.1029/2021JB022623>.
- [10] T. Davis, V. Jain, A. Ley, O. D'Hondt, **S. Valade**, and O. Hellwich, "Reference-free despeckling of synthetic-aperture radar images using a deep convolutional network," *IGARSS 2020 - IEEE International Geoscience and Remote Sensing Symposium*, 2020, pp. 3908–3911. DOI: [10.1109/IGARSS39084.2020.9323293](https://doi.org/10.1109/IGARSS39084.2020.9323293).

- [11] V. Freret-Logeril, J. Gilchrist, F. Donnadieu, A. M. Jellinek, J. Delanoë, T. Latchimy, J. P. Vinson, C. Caudoux, F. Peyrin, C. Hervier, and **S. Valade**, “Ash sedimentation by fingering and sediment thermals from wind-affected volcanic plumes,” *Earth and Planetary Science Letters*, vol. 534, p. 116 072, 2020. DOI: [10.1016/j.epsl.2020.116072](https://doi.org/10.1016/j.epsl.2020.116072).
- [12] F. Massimetti, D. Coppola, M. Laiolo, **S. Valade**, C. Cigolini, and M. Ripepe, “Volcanic hot-spot detection using sentinel-2: A comparison with modis-mirova thermal data series,” *Remote Sensing*, vol. 12, no. 5, 2020. DOI: [10.3390/rs12050820](https://doi.org/10.3390/rs12050820).
- [13] N. Sainlot, I. Vlastélic, S. Moune, E. Rose-Koga, F. Schiavi, **S. Valade**, and F. Aguilera, “Uptake of gaseous thallium, tellurium, vanadium and molybdenum into anhydrous alum, lascar volcano fumaroles, chile,” *Geochimica et Cosmochimica Acta*, vol. 275, pp. 64–82, 2020. DOI: <https://doi.org/10.1016/j.gca.2020.02.009>.
- [14] D. Loibl, B. Bookhagen, **S. Valade**, and C. Schneider, “Osaris, the “open source sar investigation system” for automatized parallel insar processing of sentinel-1 time series data with special emphasis on cryosphere applications,” *Frontiers in Earth Science*, vol. 7, p. 172, 2019. DOI: [10.3389/feart.2019.00172](https://doi.org/10.3389/feart.2019.00172).
- [15] **S. Valade**, A. Ley, F. Massimetti, O. D’Hondt, M. Laiolo, D. Coppola, D. Loibl, O. Hellwich, and T. R. Walter, “Towards global volcano monitoring using multisensor sentinel missions and artificial intelligence: The mounts monitoring system,” *Remote Sensing*, vol. 11, no. 13, 2019. DOI: [10.3390/rs11131528](https://doi.org/10.3390/rs11131528).
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- [18] M. Ripepe, E. Marchetti, D. Delle Donne, R. Genco, L. Innocenti, G. Lacanna, and **S. Valade**, “Infrasonic early warning system for explosive eruptions,” *Journal of Geophysical Research: Solid Earth*, vol. 123, no. 11, pp. 9570–9585, 2018. DOI: [10.1029/2018JB015561](https://doi.org/10.1029/2018JB015561).
- [19] **S. Valade**, M. Ripepe, G. Giuffrida, K. Karume, and D. Tedesco, “Dynamics of mount nyiragongo lava lake inferred from thermal imaging and infrasound array,” *Earth and Planetary Science Letters*, vol. 500, pp. 192–204, 2018. DOI: <https://doi.org/10.1016/j.epsl.2018.08.004>.
- [20] M. Ripepe, M. Pistolesi, D. Coppola, D. Delle Donne, R. Genco, G. Lacanna, M. Laiolo, E. Marchetti, G. Ulivieri, and **S. Valade**, “Forecasting effusive dynamics and decompression rates by magmastatic model at open-vent volcanoes,” *Scientific Reports*, vol. 7, no. 1, 2017. DOI: [10.1038/s41598-017-03833-3](https://doi.org/10.1038/s41598-017-03833-3).
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- [22] F. Donnadieu, P. Freville, C. Hervier, M. Coltelli, S. Scollo, M. Prestifilippo, **S. Valade**, S. Rivet, and P. Cacault, “Near-source doppler radar monitoring of tephra plumes at etna,” *Journal of Volcanology and Geothermal Research*, vol. 312, 2016. DOI: [10.1016/j.jvolgeores.2016.01.009](https://doi.org/10.1016/j.jvolgeores.2016.01.009).
- [23] **S. Valade**, G. Lacanna, D. Coppola, M. Laiolo, M. Pistolesi, D. D. Donne, R. Genco, E. Marchetti, G. Ulivieri, C. Allocca, C. Cigolini, T. Nishimura, P. Poggi, and M. Ripepe, “Tracking dynamics of magma migration in open-conduit systems,” *Bulletin of Volcanology*, vol. 78, no. 11, p. 78, 2016. DOI: [10.1007/s00445-016-1072-x](https://doi.org/10.1007/s00445-016-1072-x).

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- [30] **S. Valade**, F. Donnadieu, P. Lesage, M. M. Mora, A. Harris, and G. E. Alvarado, “Explosion mechanisms at arenal volcano, costa rica: an interpretation from integration of seismic and doppler radar data,” *Journal of Geophysical Research: Solid Earth*, vol. 117, no. 1, pp. 1–14, 2012. DOI: [10.1029/2011JB008623](https://doi.org/10.1029/2011JB008623).
- [31] F. Donnadieu, **S. Valade**, and S. Moune, “Three dimensional transport speed of wind-drifted ash plumes using ground-based radar,” *Geophysical Research Letters*, vol. 38, no. 18, 2011. DOI: [10.1029/2011GL049001](https://doi.org/10.1029/2011GL049001).
- [32] **S. Valade** and F. Donnadieu, “Ballistics and ash plumes discriminated by doppler radar,” *Geophysical Research Letters*, vol. 38, no. 22, pp. 2–5, 2011. DOI: [10.1029/2011GL049415](https://doi.org/10.1029/2011GL049415).

Other (thesis, reports)

- [1] **S. Valade**, “Source mechanisms and dynamics of volcanic pyroclastic emissions: A perspective from doppler radar (voldorad) and other geophysical data,” Ph.D. thesis, University Blaise Pascal, Laboratoire Magmas et Volcans (France), 2012, 277 pp.
- [2] M. Mora, P. Lesage, F. Donnadieu, A. **S. Valade** Schmidt, G. Soto, W. Taylor, and G. Alvarado, “Joint seismic, acoustic and doppler radar observations at arenal volcano, costa rica: Preliminary results,” University of Melbourne, 2009, In: Bean C. et al., VOLUME project, EU PF6 (No. 018471). ISBN 978-1-905254-39-2, VOLUME Project Consortium, Dublin.
- [3] **S. Valade**, “Etude des panaches de cendres du popocatépetl (mexique) par radar doppler: Premiers enseignements sur la surveillance à long terme de volcans explosifs avec le voldorad,” M.Sc. thesis, University Blaise Pascal, Laboratoire Magmas et Volcans (France), 2008, 48 pp.
- [4] **S. Valade**, “Etude pétro-stratigraphique et tectonique du flanc nord de la valle del bove, etna (sicile, italie),” B.Sc. thesis, Institut Géologique Albert-Lapparent IGAL (France), 2006, 115 pp.

Conferences & invited talks

Conferences (selection):

1. talk **Valade S.** (2021) Volcanic hazard monitoring from space using MOUNTS, 90° Congresso della Società Geologica Italiana (SGI), Trieste, 14-16 Sept. 2021

2. **talk** D'Hondt O., Valade S., Hellwich O. (2019) Nonlocal filtering of polarimetric SAR images applied to change detection for volcano monitoring, ESA POLINSAR, Frascati, 28-Jan – 1-Feb 2019
3. **talk** Valade S., et al. (2018) MOUNTS: a Sentinel-powered volcano monitoring system, Cities on Volcanoes 10, Naples (Italy), 6 Sept. 2018
4. **poster** Genco R., Valade S., Villeneuve N., Peltier A., Ferrazzini V., Di Muro A., Ripepe M. (2016) Infrasound of basaltic effusive activity at Piton de la Fournaise Volcano, EGU General Assembly 2016, Vienna (Austria), 12-17 Apr. 2016
5. **talk** Valade S., et al. (2015) Internal dynamics and eruptive behaviour of Stromboli volcano: insights from the 2014 eruption, EGU General Assembly 2015, Vienna (Austria), Apr. 2015
6. **poster** Valade S., Ripepe M., Ulivieri G., Marchetti E., Evolution of eruption dynamics during ash-rich lava fountaining episodes revealed by infrasonic monitoring, Cities on Volcanoes 8, Yogyakarta (Indonesia), 9-13 Sept. 2014
7. **talk** Valade S., Cerminara, M. (2013) Reconstruction of Volcanic Plume Properties Through Integration of Infrared Imagery and Analytical One-dimensional Models, IAVCEI General Assembly 2013, Kagoshima (Japan), 20–24 Jul. 2013
8. **poster** Valade S., Harris, A., Sawyer, G., Donnadiou, F., Labazuy, P., Kelfoun, K., Bombrun, M., Barra, V., Hervier, C., Ripepe, M., Delle Donne, D., Lacanna, G., Burton, M., Chevalier, L., Stachowicz, T. (2013) Full bandwidth remote sensing for total parameterization of volcanic plumes. IAVCEI General Assembly 2013, Kagoshima (Japan), 20–24 Jul. 2013
9. **poster** Valade S., Harris, A. (2013) Ground-based imaging of volcanic plumes for mass flux, 2nd IUGG-WMO workshop on Ash dispersal forecast and civil aviation, World Meteorological Organization, Geneva, Switzerland, 18-20 Nov. 2013
10. **talk** Harris, A., Valade S., et al. (2012) Full bandwidth remote sensing for total geophysical parameterization of volcanic emissions at Stromboli, CNFGG conference (French National Comity of Geodesy and Geophysics), Clermont-Ferrand, 10-12 Oct. 2012
11. **poster** Valade S., Donnadiou, F., Augier, A., Gouhier, M. (2011) Discriminating ash plume and ballistics using ground-based Doppler radar: constraints on eruptive parameters from inverse modeling. London Geological Society, William Smith Meeting " Remote sensing of volcanoes & volcanic processes: integrating observation & modeling", 4-5 Oct. 2011
12. **talk** Valade S., Donnadiou, F., Lesage, P., Mora Fernandez, M. Harris, A. J., Alvarado, G. E., (2010) Linking conduit and surface activity at Arenal volcano using broadband seismometers and Doppler radar: do we need a new conduit model?, AGU Fall Meeting, San Francisco, 13-17 Dec. 2010
13. **poster** Valade S., Donnadiou, F., Lesage, P., Fernandez, M. M., Harris, A. J., Alvarado, G. E. (2010) From conduit to surface dynamics at Arenal (Costa Rica): insights from Doppler radar and broadband seismic data, Workshop of the European Seismological Commission (ESC, "Earthquakes and Volcanoes"), Annual Workshop, Besse (France), 26-30 Oct. 2009
14. **talk** Valade S., Donnadiou F., Lesage P., Mora M., Hervier C. (2009) Cross-correlations of Doppler radar and seismic records: insights into the explosive source mechanisms at Arenal volcano, Costa Rica, Workshop of the IAVCEI Commission on Explosive Volcanism, Clermont-Ferrand (France), 26-29 Oct. 2009
15. **talk** Valade S., Schmid, A., Donnadiou, F., Mora, M., Lesage, P. (2008) Multi Method Approach for the Remote Monitoring of Arenal Volcano (Costa Rica), European Seismological Commission (ESC, "Earthquakes and Volcanoes") Annual Workshop, Managua (Nicaragua), 21-27 Sept. 2008

16. **poster** Valade S., Donnadieu, F., Valdes Gonzales, C., Guevara Ortiz, E. (2008) Ground-based Doppler radar monitoring of ash plumes at Popocatépetl volcano, IAVCEI General Assembly 2008, Reykjavik (Island), 18-23 Aug. 2008

Invited talks (selection):

1. **keynote** **Lamont-Doherty Earth Observatory** (Columbia University, USA), “Workshop Novel Instrumentation to Anticipate Volcanic Eruptions”, 01-02/02/2021, *Satellite monitoring assisted by Deep Learning: a tool to help anticipate eruptions?* ([link](#))
2. **webinar** **IGP** (Instituto Geofísico del Perú), International Conference “Erupciones Volcánicas: Estrategias para la prevención y mitigación del riesgo volcánico” ([link](#)), 04-06/11/2020, *Detección y vigilancia de domos de lava desde el espacio mediante el sistema MOUNTS*
3. **webinar** **UNAM** (National Autonomous University of Mexico), 22/09/2020, *Detección de procesos eruptivos a escala mundial mediante observaciones satelitales multiparamétricas y inteligencia artificial*
4. **webinar** **CIGIDEN** (Centro Nacional de Investigación para la Gestión Integrada de Desastres Naturales, Chile), 10/09/2020, entrevista sul tema della *Gestión del riesgo de desastre y nuevas herramientas para la vulcanología* ([link](#)), parte del “Ciclo de Conversaciones CIGIDEN: Repensando la Gestión del Riesgo de Desastre y la Resiliencia”
5. **webinar** **IG-EPN** (Instituto Geofísico de la Escuela Politécnica Nacional, Ecuador), **SGC** (Colombia), **IGP/INGEMMET** (Perú), 04/09/2020, *Detección y alerta automática de emisiones de SO₂ mediante el sensor TROPOMI - satélite Sentinel-5P: Estado actual y evolución futura del sistema de vigilancia MOUNTS (Monitoring Unrest From Space)* ([link](#))
6. **webinar** **INSIVUMEH** (Instituto Nacional de Sismología Vulcanología Meteorología e Hidrología, Guatemala) - **INETER** (Instituto Nicaragüense de Estudios Territoriales), 16/06/2020, *Monitoreo volcánico por satélites con el sistema MOUNTS*
7. **webinar** **SGC** (Servicio Geológico Colombiano) - **IGP** (Instituto Geofísico del Perú) - **INGEMMET** (Instituto Geológico Minero y Metalúrgico, Perú), 12/06/2020, *Discusión sobre las Funcionalidades y Potencialidades del Sistema de Información Web del Proyecto MOUNTS* ([link](#), [link](#))
8. **seminar** **LMV** (Laboratoire Magmas et Volcans, France), 03/12/2019, *Surveillance multi-paramétrique des volcans à l'aide des satellites Sentinel et de l'intelligence artificielle* ([link](#))
9. **seminar** **GFZ** (GeoForschungsZentrum, Alemania), 15/06/2018, “Seismo-geodesy and volcano-geodesy seminar”, *Global volcano geodesy with the Sentinels*