

**Martin VALLEE**

born on 1976/11/19

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**- Seismologist -**

**Professional experience**

Since Dec 2012 ----- **Associate professor (CNAP) at Institut de Physique du Globe de Paris (IPGP).** Director of the GEOSCOPE observatory since 2015  
Dec 2004 –Dec 2012----- Researcher at Institut de Recherche pour le Développement (IRD) at Géoazur laboratory (Nice, France).  
Jan 2004 - Nov 2004 ----- European research contract at Osservatorio Vesuviano (INGV), Naples, Italy : « *Analysis of Southern Italy moderate seismicity* ».  
Mar 2003 - Dec 2003 ---- Research contract at Laboratoire de Détection Géophysique (CEA), Paris, France : « *Earthquake source study and application to seismic risk* ».  
Jun 2001-Sep 2001 : ----- Visitor at University of California Santa Cruz (UCSC) : « *Central-American subduction zone study : Costa-Rica and El Salvador* ».  
Jun 1998-Sep 1998: ----- Training period at Elf Exploration Angola : « *Isobath régional maps* ».

**Education and Diplomas**

June 2012 ----- « HDR » in seismology, University of Nice-Sophia Antipolis.  
Defense on June 7, 2012  
Nov 1999 – Jan 2003 ----- PhD in seismology at LGIT - Laboratoire de Géophysique Interne et Tectonophysique - in Grenoble, France. « *Kinematic study of earthquake rupture: Methods and resolution* ».  
Direction: Michel Bouchon  
Defense on January 6, 2003  
Jun 1999: ----- Engineering diploma ENSPG, Ecole Nationale Supérieure de Physique de Grenoble, France.  
1998-99 : ----- Master MMGE - Mécanique des Milieux Géophysiques et Environnement -, Grenoble, France : « *Equatorial seismicity study : Earthquakes and stress transfer* »

**Languages and computer science**

French : ----- Native language  
English : ----- Fluent.  
Italian, Spanish : ----- Good level of understanding and speaking  
German: ----- Notions.  
Computer science : ----- Linux and Windows - Languages Fortran, bash, Matlab...

# Publication list

## Publications in international journals (rang A):

- [1] Vallée, M., M. Bouchon, and S.Y. Schwartz, The 13 January 2001 El Salvador earthquake: a multi-data analysis, *J. Geophys. Res.*, **108**(B4), 2203, 2003.
- [2] Bouchon, M., and M. Vallée, Observation of long supershear rupture during the Ms=8.1 Kunlunshan (Tibet) earthquake, *Science*, **301**, 824-826, 2003.
- [3] Le Pichon, A., J. Guilbert, M. Vallée, J.X. Dessa, and U. Munkhuu, Infrasonic imaging of the Kunlun mountains during the great 2001 China earthquake, *Geophys. Res. Lett.*, **30**(15), 1814, 2003.
- [4] Vallée, M., Stabilizing the empirical Green function analysis : development of the projected Landweber method, *Bull. Seism. Soc. Am.*, **94**, 394-409, 2004.
- [5] Vallée, M., and M. Bouchon, Imaging coseismic rupture in far field by slip patches, *Geophys. J. Int.*, **156**, 615-630, 2004.
- [6] Delouis, B., M. Vallée, M. Meghraoui, E. Calais, S. Maouche, K. Lammali, A. Mahsas, P. Briole, F. Benhamouda, and K. Yelles, Slip distribution of the 2003 Boumerdes-Zemmouri earthquake, Algeria, from teleseismic, GPS, and coastal uplift data, *Geophys. Res. Lett.*, **31**, L18607, 2004.
- [7] Vallée, M., and F. Di Luccio, Source analysis of the 2002 Molise, southern Italy, twin earthquakes (10/31 and 11/01), *Geophys. Res. Lett.*, **32**, L12309, 2005.
- [8] Vallée, M., Rupture properties of the giant Sumatra earthquake imaged by empirical Green function analysis, *Bull. Seismol. Soc. Am.*, **97**, S103-114, 2007.
- [9] Vallée, M., M. Landès, N.M. Shapiro, and Y. Klinger, The 2001/11/14 Kokoxili (Tibet) earthquake: high frequency seismic radiation originates from the transitions between subRayleigh and supershear rupture velocity regimes, *J. Geophys. Res.*, **113**, B07305, 2008.  
*Science* Editor's choice (**321**, 1272, 5 September 2008)
- [10] Delouis B., J. Charlety, and M. Vallée, A method for rapid determination of moment magnitude M-w for moderate to large earthquakes from the near-field spectra of strong-motion records (MWSYNTH), *Bull. Seismol. Soc. Am.*, **99**, 1827-1840, 2009.
- [11] Delouis, B., J.-M. Nocquet, and M. Vallée, Slip distribution of the February 27, 2010 Mw = 8.8 Maule Earthquake (Central Chile) from static and high-rate GPS, InSAR, and broadband teleseismic data, *Geophys. Res. Lett.*, **37**, L17305, 2010.
- [12] Aksoy M.E., M.A. Meghraoui, M. Vallée, and Z. Cakir, Rupture Characteristics of the 1912 Mürefte (Ganos) Earthquake Segment of the North Anatolian Fault (Western Turkey), *Geology*, **38**, 991-994, 2010.
- [13] Bouchon M., H. Karabulut, M.P. Bouin, J. Schmittbuhl, M. Vallée, R. Archuleta, S. Das, F. Renard, and D. Marsan, Faulting characteristics of supershear earthquakes, *Tectonophysics*, **493**, 244-253, 2010.
- [14] Vallée, M., J. Charléty, A.M.G. Ferreira, B. Delouis, and J. Vergoz, SCARDEC : a new technique for the rapid determination of seismic moment magnitude, focal mechanism and source time functions for large earthquakes using body wave deconvolution, *Geophys. J. Int.*, **184**, 338-358, 2011.
- [15] Feuillet, N., F. Beauducel, E. Jacques, P. Tapponnier, B. Delouis, S. Bazin, M. Vallée, and G. King, The Mw = 6.3, November 21, 2004, Les Saintes earthquake (Guadeloupe). Tectonic setting, slip model and static stress changes, *J. Geophys. Res.*, **116**, B10301, 2011.
- [16] Mercier de Lepinay, B., A. Deschamps, F. Klingelhoefer, Y. Mazabraud, B. Delouis, V. Clouard, Y. M. Hello, J. Crozon, B. Marcaillou, D. Graindorge, M. Vallée, J. Perrot, M.-P. Bouin, J.-M. Saurel, P. Charvis, and M. St-Louis, The 2010 Haiti earthquake: a complex fault pattern constrained by seismologic and tectonic observations, *Geophys. Res. Lett.*, **38**, L22305, 2011.
- [17] Vallée, M., and E.M. Dunham, Observation of far-field Mach waves generated by the 2001 Kokoxili supershear earthquake, *Geophys. Res. Lett.*, **39**, L05311, 2012.
- [18] Zhang, G., M. Vallée, X. Shan, and B. Delouis, Evidence of sudden rupture of a large asperity during the 2008 Mw7.9 Wenchuan earthquake based on strong motion analysis, *Geophys. Res. Lett.*, **39**, L17303, 2012.
- [19] Pageot, D., S. Operto, M. Vallée, R. Brossier, and J. Virieux, A parametric analysis of two-dimensional elastic full-waveform inversion of teleseismic data for lithospheric imaging. *Geophys. J. Int.*, **193**, 1479-1505, 2013.
- [20] Orefice, A., M. Vallée, J. Balestra, B. Delouis, and A. Zollo, Refined rupture velocity estimation of the 2009 L'Aquila earthquake (Mw 6.3, Central Italy) derived from apparent source time functions, *Bull. Seismol. Soc. Am.*, **103**, 2474-2481, 2013.

- [21] Vallée, M., J.-M. Nocquet, J. Battaglia, Y. Font, M. Segovia, M. Régnier, P. Mothes, P. Jarrin, D. Cisneros, S. Vaca, H. Yepes, X. Martin, N. Béthoux, and M. Chlieh, Intense interface seismicity triggered by a shallow slow-slip event in the Central-Ecuador subduction zone, *J. Geophys. Res.*, **118**, 2965-2981, 2013.
- [22] Courboux, F., A. Dujardin, M. Vallée, B. Delouis, C. Sira, A. Deschamps, L. Honoré and F. Thouvenot, High frequency directivity effect for an Mw 4.1 earthquake, widely felt by the population in southeastern France, *Bull. Seismol. Soc. Am.*, **103**, 3347-3353, 2013.
- [23] Lentas K., A. M. G. Ferreira, M. Vallée, Assessment of SCARDEC source parameters of global large (Mw  $\geq$  7.5) subduction earthquakes, *Geophys. J. Int.*, **195**, 1989-2004, 2013.
- [24] Vallée, M., Source time function properties indicate a strain drop independent of earthquake depth and magnitude, *Nature Communications*, doi: 10.1038/ncomms3606, 2013.
- [25] Nocquet, J.-M., J. C. Villegas-Lanza, M. Chlieh, P. A. Mothes, F. Rolandone, P. Jarrin, D. Cisneros, A. Alvarado, L. Audin, F. Bondoux, X. Martin, Y. Font, M. Régnier, M. Vallée, T. Tran, C. Beauval, J. M. Maguiña Mendoza, W. Martinez, H. Tavera, and H. Yepes, Motion of continental slivers and creeping subduction in the northern Andes, *Nature Geoscience*, doi:10.1038/ngeo2099, 2014.
- [26] Vallée, M., and C. Satriano, Ten-year recurrence time between two major earthquakes affecting the same fault segment, *Geophys. Res. Lett.*, doi: 10.1002/2014GL059465, 2014.
- [27] Chlieh, M., P.A. Mothes, J.-M. Nocquet, P. Jarrin, P. Charvis, D. Cisneros, Y. Font, J.-Y. Collot, J.-C. Villegas-Lanza, F. Rolandone, M. Vallée, M. Regnier, M. Segovia, X. Martin, and H. Yepes, Distribution of discrete seismic asperities and aseismic slip along the Ecuadorian megathrust, *Earth Planet. Sci. Lett.*, **400**, 292–301, doi: 10.1016/j.epsl.2014.05.027, 2014.
- [28] Bletery, Q., A. Sladen, B. Delouis, M. Vallée, J.-M. Nocquet, L. Rolland and J. Jiang, A detailed source model for the Mw9.0 Tohoku-Oki earthquake reconciling Geodesy, Seismology and tsunami records, *J. Geophys. Res.*, **119**, doi:10.1002/2014JB011261, 2014.
- [29] Grandin, R., M. Vallée, C. Satriano, R. Lacassin, Y. Klinger, M. Simoes and L. Bollinger, Rupture process of the Mw=7.9 2015 Gorkha earthquake (Nepal):insights into Himalayan megathrust segmentation, *Geophys. Res. Lett.*, doi: 10.1002/2015GL066044, 2015.
- [30] Villegas-Lanza, J.C., J.-M. Nocquet, F. Rolandone, M. Vallée, H. Tavera, F. Bondoux, T. Tran, X. Martin and M. Chlieh, A mixed seismic–aseismic stress release episode in the Andean subduction zone, *Nature Geoscience*, doi:10.1038/ngeo2620, 2015.
- [31] Zhang, G., E.A. Hetland, X. Shan, M. Vallée, Y. Liu, Y. Zhang, and C. Qu, Triggered slip on a back reverse fault in the Mw6.8 2013 Lushan, China earthquake revealed by joint inversion of local strong motion accelerograms and geodetic measurements, *Tectonophysics*, **672-673**, 24-33, 2016.
- [32] Courboux, F., M. Vallée, M. Causse, and A. Chounet, Stress-drop variability of shallow earthquakes extracted from a global database of Source Time Functions, *Seismol. Res. Lett.*, **87**, 912-918, doi:10.1785/0220150283, 2016.
- [33] Vallée, M., and V. Douet, A new database of source time functions (STFs) extracted from the SCARDEC method, *Phys. Earth Planet. Inter.*, **257**, 149-157, 2016.
- [34] Nocquet, J.-M., P. Jarrin, M. Vallée, P. A. Mothes, R. Grandin, F. Rolandone, B. Delouis, H. Yepes, Y. Font, D. Fuentes, M. Régnier, A. Laurendeau, D. Cisneros, S. Hernandez, A. Sladen, J.-C. Singaicho, H. Mora, J. Gomez, L. Montes, and P. Charvis, Supercycle at the Ecuadorian subduction zone revealed after the 2016 Pedernales earthquake, *Nature Geoscience*, **10**, 2, 145-149, doi:10.1038/ngeo2864, 2017.
- [35] Beauval, C., J. Marinière, A. Laurendeau, J.-C. Singaicho, C. Viracucha, M. Vallée, E. Maufroy, D. Mercerat, H. Yepes, M. Ruiz, and A. Alvarado, Comparison of observed ground-motion attenuation for the 16 April 2016 Mw 7.8 Ecuador megathrust earthquake and its two largest aftershocks with existing ground-motion prediction equations, *Seismol. Res. Lett.*, **88**, 287-299, 2017.
- [36] Grandin, R., M. Vallée, and R. Lacassin, Rupture process of the Mw 5.8 Pawnee, Oklahoma, earthquake from Sentinel-1 InSAR and seismological data, *Seismol. Res. Lett.*, **88**, 994-1004, 2017.
- [37] Champenois, J., S. Baize, M. Vallée, H. Jomard, A. Alvarado, P. Espin, G. Ekström and L. Audin, Evidences of surface rupture associated with a low-magnitude (Mw5.0) shallow earthquake in the Ecuadorian Andes, *J. Geophys. Res.*, doi:10.1002/2017JB013928, 2017.
- [38] Chounet, A., M. Vallée, M. Causse and F. Courboux, Global catalog of earthquake rupture velocities shows anticorrelation between stress drop and rupture velocity, *Tectonophysics*, doi:10.1016/j.tecto.2017.11.005, 2017.
- [39] Vallée, M., J. P. Ampuero, K. Juhel, P. Bernard, J.-P. Montagner and M. Barsuglia, Observations and modeling of the elastogravity signals preceding direct seismic waves, *Science*, **358**, 1164-1168, doi :10.1126/science.aao0746, 2017.

**PhD Thesis :**

Vallée, M., Etude cinématique de la rupture sismique en champ lointain: méthodes et résolution, *Thèse de doctorat de l'Université Joseph Fourier – Grenoble I*, 2003.

**HDR (« Habilitation à Diriger des Recherches »)**

Vallée, M., Caractérisation de la source sismique : depuis les études globales jusqu'aux analyses détaillées du processus de rupture, *Habilitation à Diriger des Recherches de l'Université de Nice-Sophia Antipolis*, 2012.