

LUIS FABIÁN BONILLA

Education

UNIVERSITY OF CALIFORNIA SANTA BARBARA

1996–2000 Ph.D. in Geological Sciences. My dissertation topic is “Computation of Linear and Nonlinear Site Response for Near Field Ground Motion“.

UNIVERSITY OF CALIFORNIA SANTA BARBARA 1994–1996 MSc. in Geophysics.

1984-1991 Geotechnical Engineer, Magna Cum Laude.

ESCUELA POLITECNICA NACIONAL, QUITO -ECUADOR

Honors and Awards

USAID Scholarship, 1994 -1996

Interests

Linear and Nonlinear Site Response Vertical
Downhole Array Data Analysis Empirical
Green’s Functions Probabilistic Seismic
Hazard Analysis

Positions Held

Researcher: 4/2002 -present, IRSN, France Postdoctoral Researcher: 11/2000 -
3/2002, IRSN, France Postdoctoral Researcher: 7/2000 -10/2000, UC Santa
Barbara, USA Graduate Research Assistant: 1996 -6/2000, UC Santa Barbara,
USA Teaching Assistant: 9/1996 -12/1996, UC Santa Barbara, USA Teaching
Assistant: 1/1995 -3/1995, UC Santa Barbara, USA Responsible for the Ecuador
Seismic Network: 1990 -1994, EPN, Ecuador

Software Packages/Environments

SAC, MATLAB, MATHEMATICA, FORTRAN, Island Draw, LaTeX, UNIX,
Linux, MSDOS, Macintosh. Nonlinear codes: SUMDES, TESS, FLIP, NOAH.
Seismic Hazard: EQRISK, CRISIS.

Professional Associations

Earthquake Engineering Research Institute Seismological Society of America
American Geophysical Union French Association of Earthquake Engineering
(AFPS)

Publications

Heuze, F., R.J. Archuleta, L.F. Bonilla, S. Day, M. Doroudian, A. Elgamal, S.
Gonzales, M. Hoehler, T. Lai, D. Lavall’ee, B. Lawrence, P.C. Liu, A. Martin,
L. Matesic, B. Minster, R. Mellors, D. Oglesby, S. Park, M. Riemer, J.H. Steidl,
F. Vernon, M. Vucetic, J. Wagoner, Z. Yang (2004). Estimating site-specific

strong earthquake motions, *Soil Dyn. and Earth. Eng.*, **24**, 199-223.

Hartzell, S., L.F. Bonilla, and R.A. Williams (2004). Prediction of Nonlinear Effects, submitted to *Bull. Seism. Soc. Am.*.

Clément Ch., O. Scotti, L.F. Bonilla, S. Baize, and C. Beauval (2004). Zoning versus faulting models in PSHA for moderate seismicity regions: preliminary results for the Tricastin nuclear site, France, *Bolletino di Geofisica Teorica ed Applicata*, Special Issue for the 28th ESC, Genova.

Archuleta, R.J., P. Liu, J.H. Steidl, L.F. Bonilla, D. Lavallée, and F. Heuze (2003). Finite-fault site-specific acceleration time histories that include nonlinear site response, *Physics of the Earth and Planetary Interiors*, **137**, 153-181.

Lavallée, D., L.F. Bonilla, and R.J. Archuleta (2003). Hysteresis Model for Nonlinear Soil under Irregular Cyclic Loadings: Introducing the Generalized Masing Rules, submitted to *Journal of Geotechnical and Geoenvironmental Engineering*.

Bonilla, L.F., F. Cotton, and R.J. Archuleta (2003). Quelques renseignements sur les effets de site non-linéaires en utilisant des données de forage: la base de mouvements forts Kik-net au Japon, *Proceedings 6me Colloque National AFPS*, 1-3 Juillet, Ecole Polytechnique, Palaiseau.

Clément Ch., S. Baize, C. Beauval, L.F. Bonilla, and O. Scotti (2003). Analyse probabiliste de l'aléa sismique sur un site d'installation nucléaire en France: investigation de la variabilité des scénarii par arbre logique et tirage aléatoire Monte Carlo, *Proceedings 6me Colloque National AFPS*, 1-3 Juillet, Ecole Polytechnique, Palaiseau.

Pousse, G., L.F. Bonilla, and F. Cotton (2003). Génération stochastique d'accélérogrammes synthétiques: validation de méthodologie, *Proceedings 6me Colloque National AFPS*, 1-3 Juillet, Ecole Polytechnique, Palaiseau.

Bonilla, L.F., J.H. Steidl, J.C. Gariel, and R.J. Archuleta (2002). Borehole Response Studies at the Garner Valley Downhole Array, Southern California, *Bull. Seism. Soc. Am.*, **92**, 3165-3179.

Archuleta, R.J., D. Lavallée, and L.F. Bonilla (2001). New Observations and Methods for Modeling Nonlinear Site Response, Proceedings of the Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, paper reference number 3.13.

Bonilla, L.F., J.H. Steidl, J.C. Gariel, and R.J. Archuleta (2000). Borehole Response of the Garner Valley Downhole Array, Southern California, Proceedings of the 6th International Conference on Seismic Zonation, paper reference number 144.

Bonilla, L.F., D. Lavallée, and R.J. Archuleta (2000). A Simple Model to Study the Effects of Hysteresis and Dilatant Behavior of Soils in Nonlinear Site Response, Proceedings of the 6th International Conference on Seismic Zonation, paper reference number 151.

Archuleta, R.J., L.F. Bonilla, M. Doroudian, A. Elgamal, F. Heuze, M. Hoehler, T. Lai, D. Lavall'ee, P.C. Liu, A. Martin, M. Riemer, J. Steidl, M. Vucetic, and Z. Yang (2000). Strong Earthquake Motion Estimates for the UCSB Campus, and Related Response of the Engineering 1 Building, Lawrence Livermore National Laboratory, UCRL-ID-138641.

Archuleta, R.J., L.F. Bonilla, and D. Lavall'ee (2000). Nonlinearity in observed and computed accelerograms. Proceeding of the 12th World Conference on Earthquake Engineering, published by Aston Koedyk Ltd. Paper reference number 0338.

Archuleta, R.J., L.F. Bonilla, and D. Lavall'ee (1999). Nonlinear Site Response Using Generalized Masing Rules Coupled with Pore Pressure, Proceedings of the OECD-NRC Workshop on Engineering Characterization of Seismic Input, Brookhaven National Laboratory, NY, 32 pp.

Steidl, J.H., R.J. Archuleta, and L.F. Bonilla (1999). Observations and Modeling of Ground Motion at the Garner Valley, California, Test Site, Proceedings of the OECD-NRC Workshop on Engineering Characterization of Seismic Input, Brookhaven National Laboratory, NY, 15 pp.

Bonilla, L.F., D. Lavall'ee, and R.J. Archuleta (1998). Nonlinear Site Response: Laboratory Modeling as a Constraint for Modeling Accelerograms, in *The Effects of Surface Geology on Seismic Motion. Vol I*, K. Irikura, K. Kudo, H. Okada, T. Sasatami Eds., Balkema, Rotterdam, 793-800.

Archuleta, R.J., G. Mullendore, and L.F. Bonilla (1998). Separating the Variability of Ground Motion over Small Distances, in *The Effects of Surface Geology on Seismic Motion. Vol I*, K. Irikura, K. Kudo, H. Okada, T. Sasatami Eds., Balkema, Rotterdam, 1059-1065.

Steidl, J.H., R.J. Archuleta, A.G. Tumarkin, L.F. Bonilla, and J.-C. Gariel (1998). Observations and Modeling of Ground Motion and Pore Pressure at the Garner Valley, California, Test Site, in *The Effects of Surface Geology on Seismic Motion. Vol I*, K. Irikura, K. Kudo, H. Okada, T. Sasatami Eds., Balkema, Rotterdam, 225-232.

Field, E.H., S. Kramer, A.-W. Elgamal, J.D. Bray, N. Matasovic, P.A. Johnson, C. Cramer, C. Roblee, D.J. Wald, L.F. Bonilla, P.P. Dimitriu, and J.G. Anderson, (1998). Nonlinear Site Response: Where We're at (A Report from a SCEC/PEER Seminar and Workshop), *Seism. Res. Letters*, **69**, 230-234.

Bonilla, L.F., J.H. Steidl, G.T. Lindley, A.G. Tumarkin, and R.J. Archuleta



(1998). Comparison of S-wave, coda, and site response methods using Northridge aftershock data. In *Proceedings of the NEHRP Conference and Workshop on Research on the Northridge, California Earthquake of January 17, 1994. Vol. II*, CUREe, Richmond CA, 216-223.

Bonilla, L.F., J.H. Steidl, G.T. Lindley, A.G. Tumarkin, and R.J. Archuleta (1997). Site Amplification in the San Fernando Valley, California: Variability



of Site-Effect Estimation Using the S-wave, Coda, and Methods, *Bull. Seism. Soc. Am.*, **87**, 710-730.

Bonilla, L.F., J.H. Steidl, and A.G. Tumarkin, (1996). Site Amplification in the San Fernando Valley from Weak-and Strong-motion Data, in *Proceedings of the 11th World Conference on Earthquake Engineering, Acapulco, Mexico, June 23-28*, Elsevier.

Steidl, J.H., L.F. Bonilla, and A.G. Tumarkin, (1995). Seismic Hazard in the San Fernando Basin, Los Angeles, CA: A Site Effect Study Using Weakmotion and Strong-motion Data, in *Proceedings of the Fifth International Conference on Seismic Zonation, October 17-19, Nice, France, Vol. II*, 1149-1156.

Yepes, H.A., L.F. Bonilla, M.C. Ruiz, (1993). Earthquake Hazard Assesment, Country Report of Ecuador, *IASPEI/ESC Volume of World-Wide Seismic Hazard Assesment Techniques*, Ed. R. McGuire.

Bonilla, L.F., M.C. Ruiz, and H.A. Yepes (1992). Evaluation of Seismic Hazard in Ecuador, in *Proceedings from International Symposium on Earthquake Disaster Prevention, Mexico*, 118-125.

Abstracts Bonilla, L.F., F. Cotton, and C. Berge-Thierry (2002). Nonlinear Site Response: PGA Distribution from Observed and Simulated Borehole Data, EGS XXVII General Assembly.

Bonilla, L.F., P.C. Liu, and R.J. Archuleta (2001). Nonlinear Site Response Analysis by Modeling P-SV Nonlinear Wave Propagation in 2D Heterogenous Media, 10th International Conference on Soil Dynamics and Earthquake Engineering, Volume of Abstracts, 25.

Steidl, J.H., R.J. Archuleta, and L.F. Bonilla (2001). Pore Pressure Observations from the 1999 M7.1 Hector Mine Earthquake on the Liquefaction Array at the Garner Valley Engineering Seismology Test Site, 10th International Conference on Soil Dynamics and Earthquake Engineering, Volume of Abstracts, 195.

Lussou, P., L.F. Bonilla, P.Y. Bard, and F. Cotton (2001). Importance of Modeling Ground Motion Time Histories in Nonlinear Site Response, EGS XXVI General Assembly.

Bonilla, L.F., D. Lavallée, R.J. Archuleta, and P.C. Liu (2000). Statistical Analysis of the Peak Ground Acceleration for Probabilistic Seismic Hazard Studies Considering Nonlinear Site Response, *EOS, Am. Geophys. Union Trans.*, **81**, 826.

Steidl, J.H., L.F. Bonilla, and R.J. Archuleta (2000). Borehole Observations of Pore Pressure and Ground Motions from the 1999 Hector Mines Earthquake, *EOS, Am. Geophys. Union Trans.*, **81**, 841.

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Archuleta, R.J., L.F. Bonilla, P.C. Liu, D. Lavallée, and J.H. Steidl (2000). Strong Ground Motion Time Histories from Stochastic Simulations of M6.8 Earthquakes and Nonlinear Wave Propagation at the UCSB Campus, *Seism. Res. Letters*, **71**, 220.

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Steidl, J.H., R.J. Archuleta, and L.F. Bonilla (1999). Application of Site Characterization Studies to Ground Motion Prediction: Analysis of Vertical Array Data from Well Characterized Sites in California, *Seism. Res. Letters*, **70**, 251.

Lavallée, D., L.F. Bonilla, and R.J. Archuleta (1998). Modeling of Nonlinear Soil Dynamics: From Laboratory Data to Earthquake Strong Ground Motion, *EOS, Am. Geophys. Union Trans.*, **76**, 6-7.

Archuleta, R.J., J.H. Steidl, A.G. Tumarkin, L.F. Bonilla, R. Nigbor (1998). Analysis of Downhole and Surface Recordings in the Epicentral Area of the Mw 5.1 San Juan Bautista Earthquake 08/12/98, *EOS, Am. Geophys. Union Trans.*, **79**, p. 577.

Bonilla, L.F., D. Lavallée, and R.J. Archuleta (1998). Nonlinear Site Response: From Laboratory Modeling to Field Data Modeling, *Seism. Res. Letters*, **69**, 148-149.

Bonilla, L.F., F. Cotton, P. Volant, J.H. Steidl, and R.J. Archuleta (1997). Applicability of the _____ Method to Estimate Site Response Using Earthquake and Noise Recordings: Example at Garner Valley, CA Downhole Array, *EOS, Am. Geophys. Union Trans.*, **78**, p. 432.

Gariel, J.-C., L.F. Bonilla, J.H. Steidl, and R.J. Archuleta (1997). 1-D Site Response Modeling at the Garner Valley Downhole Array, California, *EOS, Am. Geophys. Union Trans.*, **78**, p. 432.

Bonilla, L.F., J.H. Steidl, R.J. Archuleta, and G. Mullendore (1997). Linear and Equivalent-linear Site Response Analysis on Data from the Garner Valley, California Borehole Array, *Seism. Res. Letters*, **68**, p. 309.

Steidl, J.H., L.F. Bonilla, A.G. Tumarkin, and R.J. Archuleta (1997). The Response of Groundwater and the Rock Mass to Earthquake Ground Motion at the Garner Valley Downhole Array, *Seism. Res. Letters*, **68**, p. 301.

Bonilla, L.F., J.H. Steidl, and R.J. Archuleta (1996). On the Use of Borehole Data to Estimate Site Response and the Effects of the Downgoing Waves, *EOS, Am. Geophys. Union Trans.*, **77**, p. 494.

Steidl, J.H., L.F. Bonilla, A.G. Tumarkin, and R.J. Archuleta (1996). A Multidisciplinary Approach to Site Response Analysis, *EOS, Am. Geophys. Union Trans.*, **77**, p. 493.

Steidl, J.H., L.F. Bonilla, and A.G. Tumarkin (1995). Site Effect Study in the San Fernando Basin, Los Angeles, California: A Comparison of Methods, *EOS, Am. Geophys. Union Trans.*, **76**, p. 351.