

Electronic Appendix

This thesis includes a CD-ROM containing 70 interferograms we made of the potentially active volcanoes and calderas in the central Andes, but does not include all of the interferograms we have made. The interferograms are linked to HTML tables of the volcanoes ([volc.html](#)) and calderas ([calderas.html](#)). A clickable map ([map.html](#)) is also available, whereby the user can click on a volcano or caldera to see the interferograms.

The tables of the volcanoes and calderas are also available online – volcanoes (<http://resolver.caltech.edu/CaltechBLOB:ETD.etd-06022003-105512.1>) and calderas (<http://resolver.caltech.edu/CaltechBLOB:ETD.etd-06022003-105512.2>).

Bibliography

- Adams, N. K., S. L. de Silva, S. Seld, G. Salas, S. Schubring, J. L. Permenter, and K. Arbesman, The physical volcanology of the 1600 eruption of Huaynaputina, southern Peru, *Bull. Volcanol.*, *62*, 493–518, 2001.
- Allmendinger, R. W., T. E. Jordan, S. M. Kay, and B. L. Isacks, The evolution of the Altiplano-Puna plateau of the central Andes, *Ann. Rev. Earth Planet Sci.*, *25*, 139–174, 1998.
- Amelung, F., and S. Day, InSAR observations of the 1995 Fogo, Cape Verde, eruption: Implications for the effects of collapse events upon island volcanoes, *Geophys. Res. Lett.*, *29*, 10.1029/2001GL013760, 2002.
- Amelung, F., S. Jónsson, H. Zebker, and P. Segall, Widespread uplift and ‘trapdoor’ faulting on Galápagos volcanoes observed with radar interferometry, *Nature*, *407*, 993–996, 2000.
- Angermann, D., J. Klotz, and C. Reigber, Space-geodetic estimation of the Nazca-South America Euler vector, *Earth Planet. Sci. Lett.*, *171*, 329–334, 1999.
- Armijo, R., and R. Thiele, Active faulting in northern Chile: ramp stacking and lateral decoupling along a subduction plate boundary?, *Earth Planet. Sci. Lett.*, *98*, 40–61, 1990.
- Árnadóttir, T., and P. Segall, The 1989 Loma Prieta earthquake imaged from inversion of geodetic data, *J. Geophys. Res.*, *99*, 21,835–21,855, 1994.
- Azúa, B. M., C. DeMets, and T. Masterlark, Strong interseismic coupling, fault after-slip, and viscoelastic flow before and after the Oct. 9, 1995 Colima-Jalisco earth-

- quake: Continuous GPS measurements from Colima, Mexico, *Geophys. Res. Lett.*, *29*, 10.1029/2002GL014702, 2002.
- Babeyko, A. Y., S. V. Sobolev, R. B. Trumbull, O. Oncken, and L. L. Lavier, Numerical models of crustal scale convection and partial melting beneath the Altiplano-Puna plateau, *Earth Planet. Sci. Lett.*, *199*, 373–388, 2002.
- Baker, M. C. W., and P. W. Francis, Upper Cenozoic volcanism in the central Andes – Ages and volumes, *Earth Planet. Sci. Lett.*, *41*, 175–187, 1978.
- Barrientos, S., Large thrust earthquakes and volcanic eruptions, *Pure Appl. Geophys.*, *142*, 225–237, 1994.
- Basu, A., and L. N. Frazer, Rapid determination of the critical temperature in simulated annealing inversion, *Science*, *249*, 1409–1412, 1990.
- Battaglia, M., C. Roberts, and P. Segall, Magma intrusion beneath Long Valley caldera confirmed by temporal changes in gravity, *Science*, *285*, 2119–2122, 1999.
- Beauducel, B., P. Briole, and J.-L. Foger, Volcano-wide fringes in ERS synthetic aperture radar interferograms of Etna (1992-1998): Deformation or tropospheric effect?, *J. Geophys. Res.*, *105*, 16,391–16,402, 2000.
- Beauducel, F., and F.-H. Cornet, Collection and three-dimensional modeling of GPS and tilt data at Merapi volcano, Java, *J. Geophys. Res.*, *104*, 725–736, 1999.
- Beck, S. L., and L. J. Ruff, The rupture process of the great 1979 Colombia earthquake: Evidence from the asperity model, *J. Geophys. Res.*, *89*, 9281–9291, 1984.
- Beck, S. L., and L. J. Ruff, Great earthquakes and subduction along the Peru trench, *Phys. Earth Planet. Inter.*, *57*, 199–224, 1989.
- Benioff, H., F. Press, and S. W. Smith, Excitation of free oscillations of Earth by earthquakes, *J. Geophys. Res.*, *66*, 605–619, 1961.

- Berrino, G., H. Rymer, G. C. Brown, and G. Corrado, Gravity height correlations for unrest at calderas, *J. Volcanol. Geotherm. Res.*, *53*, 11–26, 1992.
- Bevis, M., E. C. Kendrick, R. S. Jr., T. Herring, J. Godoy, and F. Galban, Crustal motion north and south of the Arica deflection: Comparing recent geodetic results from the central Andes, *Geochem. Geophys. Geosys.*, *1*, 10.1029/1999GC000011, 1999.
- Bilek, S. L., and L. J. Ruff, Analysis of the 23 June 2001 $M_w = 8.4$ Peru underthrusting earthquake and its aftershocks, *Geophys. Res. Lett.*, *29*, 10.1029/2002GL015543, 2002.
- Bonaccorso, A., Dynamic inversion of ground deformation data for modelling volcanic sources (Etna 1991-93), *Geophys. Res. Lett.*, *23*, 451–454, 1996.
- Bonafede, M., Hot fluid migration – an efficient source of ground deformation: application to the 1982-85 crisis at Campi Flegrei, Italy, *J. Volc. Geotherm. Res.*, *48*, 187–198, 1991.
- Bredenhoef, J., Response of well-aquifer systems to earth tides, *J. Geophys. Res.*, *72*, 3075–3087, 1967.
- Brodsky, E. E., Studies in fluid dynamics as applied to seismology and volcanology, Ph.D. thesis, California Institute of Technology, Pasadena, CA, 2001.
- Buckley, S., Radar interferometry measurement of land subsidence, Ph.D. thesis, University of Texas, Austin, TX, 2000.
- Bürgmann, R., P. A. Rosen, and E. J. Fielding, Synthetic aperture radar interferometry to measure Earth's surface topography and its deformation, *Ann. Rev. Earth Planet. Sci.*, *28*, 169–209, 2000.
- Bürgmann, R., M. G. Kogan, V. E. Levin, C. H. Scholz, R. W. King, and G. M. Steblov, Rapid aseismic moment release following the 5 December, 1997 Kronotsky, Kamchatka, earthquake, *Geophys. Res. Lett.*, *28*, 1331–1334, 2001.

- Carlo, D. L., T. Lay, C. J. Ammon, and J. Zhang, Rupture process of the 1995 Antofagasta subduction earthquake ($M_w=8.1$), *Pure Appl. Geophys.*, *154*, 677–709, 1999.
- Cattin, R., P. Briole, H. Lyon-Caen, P. Bernard, and P. Pinettes, Effects of superficial layers on coseismic displacements for a dip-slip fault and geophysical implications, *Geophys. J. Int.*, *137*, 149–158, 1999.
- Cayol, V., and F. H. Cornet, Effects of topography on the interpretation of the deformation field of prominent volcanoes – Application to Etna, *Geophys. Res. Lett.*, *25*, 1979–1982, 1998.
- Cervelli, P., M. H. Murray, P. Segall, Y. Aoki, and T. Kato, Estimating source parameters from deformation data, with an application to the March 1997 earthquake swarm off the Izu Peninsula, Japan, *J. Geophys. Res.*, *106*, 11,217–11,237, 2001.
- Chatelain, J.-L., B. Guillier, P. Guéguen, and F. Bondoux, The M_w 7.7 Nasca, (Peru) earthquake, November 12, 1996: A repetition of the 1942 event?, *Seismol. Res. Lett.*, *68*, 917–922, 1997.
- Chmielowski, J., G. Zandt, and C. Haberland, The central Andean Altiplano-Puna Magma Body, *Geophys. Res. Lett.*, *26*, 783–786, 1999.
- Chorowicz, J., B. Deffontaines, D. Huamanrodrigo, R. Guillande, F. Leguern, and J. C. Thouret, SPOT satellite monitoring of the eruption of Nevado Sabancaya Volcano (southern Peru), *Remote Sensing of Environment*, *42*, 43–49, 1992.
- Choy, G. L., and V. F. Cormier, Direct measurement of the mantle attenuation operator from broadband P and S waveforms, *J. Geophys. Res.*, *91*, 7326–7342, 1986.
- Choy, G. L., and J. W. Dewey, Rupture process of an extended earthquake sequence: Teleseismic analysis of the Chilean earthquake of March 3, 1985, *J. Geophys. Res.*, *93*, 1103–1118, 1988.

- Christensen, D. H., and L. J. Ruff, Analysis of the trade-off between hypocentral depth and source time function, *Bull. Seismol. Soc. Am.*, *75*, 1637–1656, 1985.
- Coleman, T. F., and Y. Li, A reflective Newton method for minimizing a quadratic function subject to bounds on some of the variables, *SIAM Journal on Optimization*, *6*, 1040–1058, 1996.
- Comte, D., and M. Pardo, Reappraisal of great historical earthquakes in the northern Chile and southern Peru seismic gaps, *Natural Hazards*, *4*, 23–44, 1991.
- Comte, D., and G. Suárez, Stress distribution and geometry of the subducting Nazca plate in northern Chile using teleseismically recorded earthquakes, *Geophys. J. Int.*, *122*, 419–440, 1995.
- Comte, D., M. Pardo, L. Dorbath, C. Dorbath, H. Haessler, L. Rivera, A. Cisternas, and L. Ponce, Determination of seismogenic interplate contact zone and crustal seismicity around Antofagasta, northern Chile, *Geophys. J. Int.*, *116*, 553–561, 1994.
- Crisp, J. A., Rates of magma emplacement and volcanic output, *J. Volc. Geotherm. Res.*, *20*, 177–211, 1984.
- Curlander, J., and R. N. McDonough, *Synthetic aperture radar: Systems and signal processing*, Wiley, New York, 1991.
- Curtis, G. H., The stratigraphy of the ejecta of the 1912 eruption of Mount Katmai and Novarupta, Alaska, in *Studies in volcanology, a memoir in honor of Howell Williams*, edited by R. R. Coats, R. L. Hay, and C. A. Anderson, Geol. Soc. Mem. 116, pp. 153–210, GSA, Boulder, CO, 1968.
- Davidson, J. P., R. S. Harmon, and G. Worner, The source of central Andean magmas: Some considerations, in *Andean magmatism and its tectonic setting*, edited by R. S. Harmon and C. W. Rapela, Geol. Soc. Spec. Pap. 265, pp. 233–243, GSA, Boulder, CO, 1991.

- Davis, P. M., Surface deformation due to inflation of an arbitrarily oriented triaxial ellipsoidal cavity in an elastic half-space, with reference to Kilauea Volcano, Hawaii, *J. Geophys. Res.*, *91*, 7429–7438, 1986.
- de Silva, S. L., Altiplano-Puna volcanic complex of the central Andes, *Geology*, *17*, 1102–1106, 1989.
- de Silva, S. L., and P. W. Francis, *Volcanoes of the central Andes*, Springer-Verlag, New York, 1991.
- Delacourt, C., P. Briole, and J. Achache, Tropospheric corrections of SAR interferograms with strong topography. Application to Etna, *Geophys. Res. Lett.*, *25*, 2849–2852, 1998.
- Delaney, P. T., and D. F. McTigue, Volume of magma accumulation or withdrawal estimated from surface uplift or subsidence, with application to the 1960 collapse of Kilauea volcano, *Bull. Volcanol.*, *56*, 417–424, 1994.
- Delouis, B., A. Cisternas, L. Dorbath, L. Rivera, and E. Kausel, The Andean subduction zone between 22 and 25° (northern Chile): Precise geometry and state of stress, *Tectonophysics*, *259*, 81–100, 1996.
- Delouis, B., T. Monfret, L. Dorbath, M. Pardo, L. Rivera, D. Comte, H. Haessler, J. P. Caminade, L. Ponce, E. Kausel, and A. Cisternas, The $M_w=8.0$ Antofagasta (Northern Chile) earthquake of 30 July 1995: A precursor to the end of the large 1877 gap, *Bull. Seismol. Soc. Am.*, *87*, 427–445, 1997.
- Delouis, B., H. Phillip, L. Dorbath, and A. Cisternas, Recent crustal deformation in the Antofagasta region (northern Chile) and the subduction process, *Geophys. J. Int.*, *132*, 302–338, 1998.
- Delouis, B., D. Giardini, P. Lundgren, and J. Salichon, Joint inversion of InSAR, GPS, teleseismic, and strong-motion data for the spatial and temporal distribution of earthquake slip: Application to the 1999 Izmit mainshock, *Bull. Seismol. Soc. Am.*, *92*, 278–299, 2002.

- DeMets, C., R. G. Gordon, D. F. Argus, and S. Stein, Effect of recent revisions to the geomagnetic reversal time scale on estimates of current plate motions, *Geophys. Res. Lett.*, *21*, 2191–2194, 1994.
- Deng, J., K. Hudnut, M. Gurnis, and E. Hauksson, Stress loading from viscous flow in the lower crust and triggering of aftershocks following the 1994 Northridge, California, earthquake, *Geophys. Res. Lett.*, *26*, 3209–3212, 1999.
- Denniss, A. M., A. J. L. Harris, D. A. Rothery, P. W. Francis, and R. W. Carlton, Satellite observations of the April 1993 eruption of Lascar volcano, *Int. J. Remote Sensing*, *19*, 801–821, 1998.
- Deruelle, B., O. Figueroa, E. Medina, J. Viramonte, and M. Maragano, Petrology of pumices of April 1993 eruption of Lascar (Atacama, Chile), *Terra Nova*, *8*, 191–199, 1996.
- Díaz, G. C., The Cenozoic saline deposits of the Chilean Andes between 18°00' and 27°00' south latitude, in *The southern central Andes*, edited by H. Bahlburg, C. Breitreuz, and P. Giese, vol. 17 of *Lecture notes in Earth Sciences*, pp. 137–151, Springer-Verlag, 1988.
- Dieterich, J., and R. Decker, Finite element modeling of surface deformation associated with volcanism, *J. Geophys. Res.*, *80*, 4094–4102, 1975.
- Dixon, J. P., S. Stihler, J. Power, G. Tytgat, S. Estes, S. Moran, J. Paskievitch, and S. McNutt, Catalog of earthquake hypocenters at Alaskan volcanoes: January 1, 2000 through December 31, 2001, in *USGS Open File Report 02-342*, p. 56, USGS, 2002.
- Dragert, H., K. Wang, and T. S. James, A silent slip event on the deeper Cascadia interface, *Science*, *292*, 1525–1528, 2001.
- Du, Y., A. Aydin, and P. Segall, Comparison of various inversion techniques as applied to the determination of a geophysical deformation model for the 1983 Borah Peak earthquake, *Bull. Seismol. Soc. Am.*, *82*, 1840–1866, 1992.

- Du, Y., P. Segall, and H. Gao, Quasi-static dislocations in three dimensional inhomogeneous media, *Geophys. Res. Lett.*, *24*, 2347–2350, 1997.
- Dvorak, J. J., and D. Dzurisin, Volcano geodesy: The search for magma reservoirs and the formation of eruptive vents, *Rev. Geophys.*, *35*, 343–384, 1997.
- Dvorak, J. J., and G. Mastrolorenzo, The mechanisms of recent vertical crustal movements in Campi Flegrei caldera, southern Italy, in *Spec. Pap. Geol. Soc. Am.*, vol. 263, p. 47, GSA, 1991.
- Dziewonski, A. M., G. Ekstrom, and M. P. Salganik, Centroid-moment tensor solutions for July-September 1995, *Phys. Earth Planet. Inter.*, *97*, 3–13, 1999.
- Dzurisin, D., C. Wicks, Jr., and W. Thatcher, Renewed uplift at Yellowstone caldera measured by leveling surveys and satellite radar interferometry, *Bull. Volcanol.*, *61*, 349–355, 1999.
- Emardson, T. R., M. Simons, and F. H. Webb, Neutral atmospheric delay in interferometric synthetic aperture radar applications: statistical description and mitigation, *J. Geophys. Res.*, *108*, 10.1029/2002JB001781, 2003.
- Engdahl, E. R., R. van der Hilst, and R. Buland, Global teleseismic earthquake relocation with improved travel times and procedures for depth determination, *Bull. Seismol. Soc. Am.*, *88*, 722–743, 1998.
- Feigl, K. L., J. Gasperi, F. Sigmundsson, and A. Rigo, Crustal deformation near Hengill volcano, Iceland 1993-1998: Coupling between magmatic activity and faulting inferred from elastic modeling of satellite radar interferograms, *J. Geophys. Res.*, *105*, 25,655–25,670, 2000.
- Feigl, K. L., F. Sarti, H. Vadon, S. McClusky, S. Ergintav, P. Durand, R. Burgmann, A. Rigo, D. Massonnet, and R. J. Reilinger, Estimating slip distribution for the Izmit mainshock from coseismic GPS, ERS-1, RADARSAT, and SPOT measurements, *Bull. Seismol. Soc. Am.*, *92*, 138–160, 2002.

- Fernández, A., P. K. Hörmann, S. Kussmaul, J. Meave, H. Pilcher, and T. Subieta, First petrologic data on young volcanic rocks of SW-Bolivia, *Tschermaks. Min. Pet. Mitt.*, *19*, 149–172, 1973.
- Fernández, J., K. F. Tiampo, G. Jentzsch, M. Charco, and J. B. Rundle, Inflation or deflation? New results for Mayon volcano applying elastic-gravitational modeling, *Geophys. Res. Lett.*, *28*, 2349–2352, 2001.
- Fialko, Y., Constraints on timescales and mechanics of magmatic underplating from InSAR observations of large active magma sills in the Earth's crust, *Eos Trans. AGU*, *83*, 1344–1345, 2002.
- Fialko, Y., and M. Simons, Evidence for on-going inflation of the Socorro magma body, New Mexico, from interferometric synthetic aperture radar imaging, *Geophys. Res. Lett.*, *28*, 3549–3552, 2001.
- Fialko, Y., Y. Khazan, and M. Simons, Deformation due to a pressurized horizontal circular crack in an elastic half-space, with applications to volcano geodesy, *Geophys. J. Int.*, *146*, 181–190, 2001a.
- Fialko, Y., M. Simons, and D. Agnew, The complete (3-D) surface displacement field in the epicentral area of the 1999 M_w 7.1 Hector Mine earthquake, California, from space geodetic observations, *Geophys. Res. Lett.*, *28*, 3063–3066, 2001b.
- Fialko, Y., M. Simons, and Y. Khazan, Finite source modelling of magmatic unrest in Socorro, New Mexico, and Long Valley, California, *Geophys. J. Int.*, *146*, 191–200, 2001c.
- Francis, P. W., and C. J. Hawesworth, Late Cenozoic rates of magmatic activity in the central Andes and their relationships to continental crust formation and thickening, *J. Geol. Soc. Lond.*, *151*, 845–854, 1994.
- Francis, P. W., and C. C. Rundle, Rates of production of the main Andean magma types, *Geol. Soc. Am. Bull.*, *87*, 474–480, 1976.

- Francis, P. W., S. Self, C. M. Oppenheimer, and D. A. Rothery, The April 1993 eruption of Lascar, north Chile, observations and inferences (abstract), *Eos Trans. AGU*, *74*, 651, 1993.
- Fujiwara, S., P. Rosen, M. Tobita, and M. Murakami, Crustal deformation measurements using repeat-pass JERS 1 synthetic aperture radar interferometry near the Izu Peninsula, Japan, *J. Geophys. Res.*, *103*, 2411–2426, 1998.
- Fujiwara, S., T. Nishimura, M. Murakami, H. Nakagawa, M. Tobita, and P. Rosen, 2.5-D surface deformation of M6.1 earthquake near Mt Iwate detected by SAR interferometry, *Geophys. Res. Lett.*, *27*, 2049–2052, 2000.
- Gabriel, A. K., R. M. Goldstein, and H. A. Zebker, Mapping small elevation changes over large areas – Differential radar interferometry, *J. Geophys. Res.*, *94*, 9183–9191, 1989.
- Gardeweg, M. C., R. S. J. Sparks, and S. J. Matthews, Evolution of Lascar volcano, northern Chile, *J. Geol. Soc. London*, *155*, 89–104, 1998.
- Gens, R., and J. L. van Genderen, SAR interferometry – Issues, techniques, applications, *Int. J. Remote Sensing*, *17*, 1803–1835, 1996.
- Giese, P., Geothermal structure of the central Andes crust – Implications for heat transport and rheology, in *Tectonics of the southern central Andes: structure and evolution of an active continental margin*, edited by K.-J. Reutter, E. Scheuber, and P. J. Wigger, pp. 69–76, Springer-Verlag, 1994.
- Gill, P. E., W. Murray, and M. H. Wright, *Practical Optimization*, Academic Press, London, 1981.
- Giovanni, M. K., S. L. Beck, and L. Wagner, The June 23, 2001 Peru earthquake and the southern Peru subduction zone, *Geophys. Res. Lett.*, *29*, 10.1029/2002GL015774, 2002.

- Glaze, L. S., P. W. Francis, S. Self, and D. A. Rothery, The 16 September 1986 eruption of Lascar volcano, north Chile - satellite investigations, *Bull. Volcanol.*, *51*, 149–160, 1989.
- Gonzalez-Ferran, O., *Volcanes de Chile (in Spanish)*, Instituto Geografico Militar, Santiago, Chile, 1995.
- Gonzalez-Ferran, O., P. E. Baker, and D. C. Rex, Tectonic-volcanic discontinuity at latitude 27° south Andean range, associated with Nazca plate subduction, *Tectonophysics*, *112*, 423–441, 1985.
- Gordeev, E. I., A. A. Gusev, V. E. Levin, V. F. Bakhtiarov, V. M. Pavlov, V. N. Chebrov, and M. Kasahara, Preliminary analysis of deformation at the Eurasia-Pacific-North America plate junction from GPS data, *Geophys. J. Int.*, *147*, 189–198, 2001.
- Gouget, K., P. F. Ihmlé, J. Campos, and J.-P. Montagner, Self-consistent retrieval of source parameters using mantle waves, *Bull. Seismol. Soc. Am.*, *88*, 995–1002, 1998.
- Graeber, F. M., and G. Asch, Three-dimensional models of P wave velocity and P -to- S velocity ratio in the southern central Andes by simultaneous inversion of local earthquake data, *J. Geophys. Res.*, *104*, 20,237–20,256, 1999.
- Griffiths, H., Interferometric synthetic aperture radar, *Electron. Commun. Eng. J.*, *7*, 247–256, 1995.
- Guibourg, S., P. Heinrich, and R. Roche, Numerical modeling of the 1995 Chilean tsunami. Impact on French Polynesia, *Geophys. Res. Lett.*, *24*, 775–778, 1997.
- Haberland, C., and A. Rietbrock, Attenuation tomography in the western central Andes: A detailed insight into the structure of a magmatic arc, *J. Geophys. Res.*, *106*, 11,151–11,167, 2001.

- Hanssen, R. A., *Radar interferometry: Data interpretation and error analysis*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001.
- Harris, R. A., Introduction to special section: Stress triggers, stress shadows, and implications for seismic hazard, *J. Geophys. Res.*, *103*, 24,347–24,358, 1998.
- Harris, R. A., and P. Segall, Detection of a locked zone at depth on the Parkfield, California, segment of the San Andreas Fault, *J. Geophys. Res.*, *92*, 7945–7962, 1987.
- Harris, R. A., and R. W. Simpson, The 1999 Mw 7.1 Hector Mine, California, earthquake: A test of the stress shadow hypothesis?, *Bull. Seismol. Soc. Am.*, *92*, 1497–1512, 2002.
- Hartzell, S. H., and T. H. Heaton, Inversion of strong ground motion and teleseismic waveform data for the fault rupture history of the 1979 Imperial Valley, California, earthquake, *Bull. Seismol. Soc. Am.*, *73*, 1553–1583, 1983.
- Hartzell, S. H., P. Liu, and C. Mendoza, The 1994 Northridge, California earthquake: Investigation of rupture velocity, rise time, and high-frequency radiation, *J. Geophys. Res.*, *101*, 20,091–20,108, 1996.
- Hasegawa, A., and S. Sacks, Subduction of the Nazca plate beneath Peru as determined from seismic observations, *J. Geophys. Res.*, *86*, 4971–4980, 1981.
- Heki, K., and Y. Tamura, Short-term afterslip in the 1994 Sanriku-Haruka-Oki earthquake, *Geophys. Res. Lett.*, *21*, 3285–3288, 1997.
- Heki, K., S. Miyazaki, and H. Tsuji, Silent fault slip following an interplate thrust earthquake at the Japan Trench, *Nature*, *386*, 595–598, 1997.
- Hellweg, M., Listening carefully: Unique observations of harmonic tremor at Lascar volcano, Chile, *Ann. Geofis.*, *42*, 451–464, 1999.
- Hernandez, B., F. Cotton, M. Campillo, and D. Massonnet, A comparison between short term (co-seismic) and long term (one year) slip for the Landers earthquake:

- Measurements from strong motion and SAR interferometry, *Geophys. Res. Lett.*, *24*, 1579–1582, 1997.
- Hernandez, B., F. Cotton, and M. Campillo, Contribution of radar interferometry to a two-step inversion of the kinematic process of the 1992 Landers earthquake, *J. Geophys. Res.*, *104*, 13,083–13,099, 1999.
- Hirose, H., K. Hirahara, F. Kimata, N. Fukii, and S. Miyazaki, A slow thrust slip event following the two 1996 Hyugada earthquakes beneath the Bungo Channel, Southwest Japan, *Geophys. Res. Lett.*, *26*, 3237–3240, 1999.
- Hoffmann, J., The application of satellite radar interferometry to the study of land subsidence over developed aquifer systems, Ph.D. thesis, Stanford University, Stanford, CA, 2003.
- Hsu, J. T., Quaternary uplift of the Peruvian coast related to the subduction of the Nazca Ridge: 13.5 to 15.6 degrees south latitude, *Quatern. Sci. Rev.*, *15*, 87–97, 1992.
- Husen, S., and E. Kissling, Postseismic fluid flow after the large subduction earthquake of Antofagasta, Chile, *Geology*, *138*, 847–850, 2001.
- Husen, S., E. Kissling, E. Flueh, and G. Asch, Accurate hypocentre determination in the seismogenic zone of the subducting Nazca Plate in northern Chile using a combined on-/offshore network, *Geophys. J. Int.*, *138*, 687–701, 1999.
- Hutton, W., C. DeMets, O. Sánchez, G. Suárez, and J. Stock, Slip kinematics and dynamics during and after the 9 October 1995 M_w 8.0 Colima-Jalisco earthquake, Mexico, from GPS geodetic constraints, *Geophys. J. Int.*, *146*, 637–658, 2002.
- Ihmlé, P. F., and R. Madariaga, Monochromatic body waves excited by great subduction zone earthquakes, *Geophys. Res. Lett.*, *23*, 2999–3002, 1996.
- Ihmlé, P. F., and J.-C. Ruegg, Source tomography by simulated annealing using

- broad-band surface waves and geodetic data: Application to the $M_w=8.1$ Chile 1995 event, *Geophys. J. Int.*, *131*, 146–158, 1997.
- Ihmlé, P. F., J.-M. Gomez, P. P. Heinrich, and S. Guibourg, The 1996 Peru tsunami-genic earthquake: Broadband source process, *Geophys. Res. Lett.*, *25*, 2691–2694, 1998.
- Ito, T., S. Yoshioka, and S. Miyazaki, Interplate coupling in southwest Japan deduced from inversion of GPS data, *Phys. Earth Planet. Inter.*, *115*, 17–34, 1999.
- Ji, C., D. J. Wald, and D. V. Helmberger, Source description of the 1999 Hector Mine, California, earthquake, part I: Wavelet domain inversion theory and resolution analysis, *Bull. Seismol. Soc. Am.*, *92*, 1192–1207, 2002a.
- Ji, C., D. J. Wald, and D. V. Helmberger, Source description of the 1999 Hector Mine, California, earthquake, part II: Complexity of slip history, *Bull. Seismol. Soc. Am.*, *92*, 1208–1226, 2002b.
- Johnson, D. J., F. Sigmundsson, and P. T. Delaney, Comment on “Volume of magma accumulation or withdrawal estimated from surface uplift or subsidence, with application to the 1960 collapse of Kilauea volcano” by P. T. Delaney and D. F. McTigue, *Bull. Volcanol.*, *61*, 491–493, 2000.
- Johnston, M. J. S., D. P. Hill, A. T. Linde, J. Langbein, and R. Bilham, Transient deformation during triggered seismicity from the 28 June $M_w=7.3$ Landers earthquake at Long-Valley caldera, California, *Bull. Seismol. Soc. Am.*, *85*, 787–795, 1995.
- Jónsson, S., Modeling volcano and earthquake deformation from satellite radar interferometric observations, Ph.D. thesis, Stanford University, Stanford, CA, 2002.
- Jónsson, S., H. Zebker, P. Segall, and F. Amelung, Fault slip distribution of the 1999 M_w 7.1 Hector Mine, California, earthquake, estimates from satellite radar and GPS measurements, *Bull. Seismol. Soc. Am.*, *92*, 1377–1389, 2002.

- Jordan, T. E., N. M. noz, M. Hein, T. Lowensein, L. Godfrey, and J. Yu, Active faulting and folding without topographic expression in and evaporite basin, Chile, *Geol. Soc. Am. Bull.*, *114*, 1406–1421, 2002.
- Jousset, P., H. Mori, and H. Okada, Possible magma intrusion revealed by temporal gravity, ground deformation and ground temperature observations at Mount Komagatake (Hokkaido) during the 1996-1998 crisis, *Geophys. J. Int.*, *143*, 557–574, 2000.
- Kanamori, H., Seismic and aseismic slip along subduction zones and their tectonic implications, in *Island arcs, deep sea trenches and back-arc basins*, edited by M. Talwani and W. C. Pitman, pp. 163–174, AGU, Washington, D. C., 1977.
- Kanamori, H., and J. Given, Use of long-period surface waves for rapid determination of earthquake-source parameters, *Phys. Earth Planet. Inter.*, *27*, 8–36, 1981.
- Kausel, E., and J. Campos, The $M_s = 8.0$ tensional earthquake of 9 December 1950 of northern Chile and its relation to the seismic potential of the region, *Phys. Earth Planet. Inter.*, *72*, 220–235, 1992.
- Kaverina, A., D. Dreger, and E. Price, The combined inversion of seismic and geodetic data for the source process of the 16 October 1999, M_w 7.1 Hector Mine, California, earthquake, *Bull. Seismol. Soc. Am.*, *92*, 1266–1280, 2002.
- Kawasaki, I., Y. Asai, Y. Tamura, T. Sagiya, N. Mikami, Y. Okada, M. Sakata, and M. Kasahara, The 1992 Sanriku-Oki, Japan, ultra-slow earthquake, *J. Phys. Earth*, *43*, 105–116, 1995.
- Kawasaki, I., Y. Asai, and Y. Tamura, Space-time distribution of interplate moment release including slow earthquakes and the seismo-geodetic coupling in the Sanriku-Oki region along the Japan trench, *Tectonophysics*, *330*, 267–283, 2001.
- Kendrick, E., M. Bevis, R. S. Jr., and B. Brooks, An integrated crustal velocity field for the central Andes, *Geochem. Geophys. Geosys.*, *2*, 10.1029/2001GC000191, 2001.

- Kendrick, E. C., M. Bevis, J. R. F. Smalley, O. Cifuentes, and F. Galban, Current rates of convergence across the central Andes: Estimates from continuous GPS observations, *Geophys. Res. Lett.*, *26*, 541–544, 1999.
- Klotz, J., D. Angermann, G. W. Michel, R. Porth, C. Reigber, J. Reinking, J. Viramonte, R. Perdomo, V. H. Rios, S. Barrientos, R. Barriga, and O. Cifuentes, GPS-derived deformation of the central Andes including the 1995 Antofagasta $M_w=8.0$ earthquake, *Pure Appl. Geophys.*, *154*, 709–730, 1999.
- Klotz, J., G. Khazaradze, O. Cifuentes, R. Barriga, S. Barrientos, R. Perdomo, J. Viramonte, and V. Rios, The present-day kinematics of the central and southern Andes, *Eos*, *81*, 1126, 2000.
- Klotz, J., G. K. D. Angermann, C. Reigber, R. Perdomo, and O. Cifuentes, Earthquake cycle dominates contemporary crustal deformation in central and southern Andes, *Earth Planet. Sci. Lett.*, *193*, 437–446, 2001.
- Kostrov, B. V., Seismic moment and energy of earthquakes, and seismic flow of rock, *Izv. Acad. Sci. USSR Phys. Solid Earth*, *1*, 23–40, 1974.
- Kussmaul, S., P. K. Hormann, E. Ploskonka, and T. Subieta, Volcanism and structure of southwestern Bolivia, *J. Volcanol. Geotherm. Res.*, *2*, 73–111, 1977.
- Lanari, R., P. Lundgren, and E. Sansosti, Dynamic deformation of Etna volcano observed by satellite radar interferometry, *Geophys. Res. Lett.*, *25*, 1541–1544, 1998.
- Langer, C. J., and W. Spence, The 1974 Peru earthquake series, *Bull. Seismol. Soc. Am.*, *85*, 665–687, 1995.
- Lay, T., and T. C. Wallace, *Modern global seismology*, Academic Press, San Diego, CA, 1995.
- Lay, T., H. Kanamori, and L. Ruff, The asperity model and the nature of large subduction zone earthquakes, *Earthquake Prediction Research*, *1*, 3–71, 1982.

- Lazo, M., R. Kosaka, A. Minaya, E. Gonzales, and J. Soto, Evaluación de la actividad sísmica del Volcán Sabancaya, in *Volumen de resúmenes extendidos del VII Congreso Peruano de Geología*, pp. 19–22, Sociedad Geologica del Peru, Lima, 1991.
- Leidig, M., and G. Zandt, Modeling of highly anisotropic crust and application to the Altiplano-Puna volcanic complex of the central Andes, *J. Geophys. Res.*, *108*, 10.1029/2001JB000649, 2003.
- Lohman, R. B., M. Simons, and B. Savage, Location and mechanism of the Little Skull Mountain earthquake as constrained by satellite radar interferometry and seismic waveform modeling, *J. Geophys. Res.*, *107*, 10.1029/2001JB000627, 2002.
- Lowry, A. R., M. W. Hamburger, C. M. Meertens, and E. G. Ramos, GPS monitoring of crustal deformation at Taal Volcano, Philippines, *J. Volcan. Geotherm. Res.*, *105*, 35–47, 2001a.
- Lowry, A. R., K. M. Larson, V. Kostoglodov, and R. Bilham, Transient fault slip in Guerrero, southern Mexico, *Geophys. Res. Lett.*, *28*, 3753–3756, 2001b.
- Lu, A., C. Wicks, D. Dzurisin, W. Thatcher, and J. Power, Studies of volcanoes of Alaska by satellite radar interferometry, in *Proceedings of the ERS-ENVISAT Symposium, Gothenburg, Sweden*, pp. ESA publication SP-461 (CD-ROM), 2000a.
- Lu, Z., R. Fatland, M. Wyss, S. Li, J. Eichelberger, K. Dean, and J. Freymueller, Deformation of New Trident volcano measured by ERS-1 SAR interferometry, Katmai National Park, Alaska, *Geophys. Res. Lett.*, *24*, 695–698, 1997.
- Lu, Z., D. Mann, J. Freymueller, and D. Meyer, Synthetic aperture radar interferometry of Okmok volcano, Alaska: Radar observations, *J. Geophys. Res.*, *105*, 10,791–10,806, 2000b.
- Lu, Z., C. Wicks, D. Dzurisin, W. Thatcher, J. T. Freymueller, S. R. McNutt, and D. Mann, Aseismic inflation of Westdahl volcano, Alaska, revealed by satellite radar interferometry, *Geophys. Res. Lett.*, *27*, 1567–1570, 2000c.

- Lu, Z., C. Wicks, J. Power, and D. Dzurisin, Deformation of Akutan volcano, Alaska, revealed by satellite radar interferometry, *J. Geophys. Res.*, *105*, 21,483–21,496, 2000d.
- Lu, Z., T. Masterlark, J. Power, D. Dzurisin, and C. Wicks, Subsidence at Kiska Volcano, western Aleutians, detected by satellite radar interferometry, *Geophys. Res. Lett.*, *29*, 10.1029/2002GL014948, 2002a.
- Lu, Z., J. A. Power, V. S. McConnell, C. Wicks, and D. Dzurisin, Preruptive inflation and surface interferometric coherence characteristics revealed by satellite radar interferometry at Makushin Volcano, Alaska: 1993-2000, *J. Geophys. Res.*, *107*, 10.1029/2001JB000970, 2002b.
- Lu, Z., C. Wicks, D. Dzurisin, J. A. Power, S. C. Moran, and W. Thatcher, Magmatic inflation at a dormant stratovolcano: 1996-1998 activity at Mount Peulik volcano, Alaska, revealed by satellite radar interferometry, *J. Geophys. Res.*, *107*, 10.1029/2001JB000471, 2002c.
- Lynnes, C. S., and T. Lay, Source process of the great 1977 Sumba earthquake, *J. Geophys. Res.*, *93*, 13,407–13,420, 1988.
- Manga, M., Origin of postseismic streamflow changes inferred from baseflow recession and magnitude-distance relations, *Geophys. Res. Lett.*, *28*, 2133–2136, 2001.
- Manga, M., E. E. Brodsky, and M. Boone, Response of streamflow to multiple earthquakes and implications for the origin of postseismic discharge changes, *Geophys. Res. Lett.*, *30*, 10.1029/2002GL016618, 2003.
- Mann, D., and J. T. Freymueller, Volcanic and tectonic deformation on Unimak Island in the Aleutian Arc, Alaska, *J. Geophys. Res.*, *108*, 10.1029/2002JB001925, 2003.
- Mann, D., J. Freymueller, and Z. Lu, Deformation associated with the 1997 eruption of Okmok volcano, Alaska, *J. Geophys. Res.*, *107*, 10.1029/2001JB000163, 2002.

- Marone, C., Laboratory-derived friction laws and their application to seismic faulting, *Ann. Rev. Earth Planet Sci.*, *26*, 643–696, 1998.
- Marone, C., C. H. Scholtz, and R. Bilham, On the mechanics of earthquake afterslip, *J. Geophys. Res.*, *96*, 8441–8452, 1991.
- Marsh, B. D., Magma chambers, *Ann. Rev. Earth Planet. Sci.*, *17*, 437–474, 1989.
- Marsh, B. D., and M. Maxey, On the distribution and separation of crystals in convecting magma, *J. Volc. Geotherm. Res.*, *24*, 95–150, 1985.
- Massonnet, D., and K. Feigl, Radar interferometry and its application to changes in the Earth's surface, *Rev. Geophys.*, *36*, 441–500, 1998.
- Massonnet, D., M. Rossi, C. Carmona, F. Adragna, G. Peltzer, K. Feigl, and T. Rabaute, The displacement field of the Landers earthquake mapped by radar interferometry, *Nature*, *364*, 138–142, 1993.
- Massonnet, D., P. Briole, and A. Arnaud, Deflation of Mount Etna monitored by spaceborne radar interferometry, *Nature*, *375*, 567–570, 1995.
- Massonnet, D., K. L. Feigl, H. Vadon, and M. Rossi, Coseismic deformation field of the $M = 6.7$ Northridge, California earthquake of January 17, 1994 recorded by two radar satellites using interferometry, *Geophys. Res. Lett.*, *23*, 969–972, 1996.
- Masterlark, T., C. DeMets, H. F. Wang, O. Sánchez, and J. Stock, Homogeneous vs. heterogeneous subduction zone models: Coseismic and postseismic deformation, *Geophys. Res. Lett.*, *28*, 4047–4050, 2001.
- Matthews, S. J., A. P. Jones, and M. C. Gardeweg, Lascar volcano, northern Chile – Evidence for steady-state disequilibrium, *J. Pet.*, *35*, 401–432, 1994.
- Matthews, S. J., R. A. Marquillas, A. J. Kemp, F. K. Grange, and M. C. Gardeweg, Active skarn formation beneath Lascar volcano, northern Chile: A petrographic and geochemical study of xenoliths in eruption products, *J. Met. Geo.*, *14*, 509–530, 1996.

- Matthews, S. J., M. C. Gardeweg, and R. S. J. Sparks, The 1984 to 1996 cyclic activity of Lascar Volcano, northern Chile: Cycles of dome growth, dome subsidence, and explosive eruptions, *Bull. Volcanol.*, *59*, 77–82, 1997.
- Matthews, S. J., R. S. J. Sparks, and M. C. Gardeweg, Piedras Grandes-Soncor eruptions, Lascar volcano, Chile; Evolution of zoned magma chamber in the central Andean upper crust, *J. Pet.*, *40*, 1891–1919, 1999.
- McCaffrey, R., Statistical significance of the seismic coupling coefficient, *Bull. Seismol. Soc. Am.*, *87*, 1069–1073, 1997.
- McGuire, J. J., L. Zhao, and T. H. Jordan, Predominance of unilateral rupture for a global catalog of large earthquakes, *Bull. Seismol. Soc. Am.*, *92*, 3309–3317, 2002.
- McTigue, D. F., Elastic stress and deformation near a finite spherical magma body: Resolution of the point source paradox, *J. Geophys. Res.*, *92*, 12,931–12,940, 1987.
- Melbourne, T., F. Webb, J. Stock, and C. Reigber, Rapid postseismic transients in subduction zones from continuous GPS, *J. Geophys. Res.*, *107*, 10.1029/2001JB000555, 2002.
- Melbourne, T. I., and F. H. Webb, Precursory transient slip during the 2001 $M_w = 8.4$ Peru earthquake sequence from continuous GPS, *Geophys. Res. Lett.*, *29*, 10.1029/2002GL015533, 2002.
- Mendoza, C., S. Hartzell, and T. Monfret, Wide-band analysis of the 3 March 1985 central Chile earthquake – overall source process and rupture history, *Bull. Seismol. Soc. Am.*, *84*, 269–283, 1994.
- Menke, W., *Geophysical data analysis: Discrete inverse theory*, Academic Press, New York, 1989.
- Michel, R., J.-P. Avouac, and J. Taboury, Measuring ground displacements from SAR amplitude images: Application to the Landers earthquake, *Geophys. Res. Lett.*, *26*, 875–878, 1999a.

- Michel, R., J.-P. Avouac, and J. Taboury, Measuring near-field coseismic displacements from SAR images: Application to the Landers earthquake, *Geophys. Res. Lett.*, *26*, 3017–3020, 1999b.
- Miller, M., T. Melbourne, D. Johnson, and W. Sumner, Periodic slow earthquakes from the Cascadia subduction zone, *Science*, *295*, 2423, 2002.
- Miller, T. P., R. G. McGimsey, D. H. Richter, J. R. Riehle, C. J. Nye, M. E. Yount, and J. A. Dumoulin, Catalog of the historically active volcanoes of Alaska, in *USGS Open File Report 98-582*, p. 104, USGS, 1998.
- Miyazaki, S., J. J. McGuire, and P. Segall, A transient subduction zone slip episode in southwest Japan observed by the nationwide GPS array, *J. Geophys. Res.*, *108*, 10.1029/2001JB000456, 2003.
- Monfret, T., L. Dorbath, J. P. Caminade, M. Pardo, D. Comte, and L. Ponce, The July 30, Antofagasta earthquake: An ‘hypocritical’ seismic event, *Eos Trans. AGU*, *76*, 427, 1995.
- Montgomery, D. R., G. Balco, and S. D. Willett, Climate, tectonics, and the morphology of the Andes, *Geology*, *29*, 579–582, 2001.
- Muller, J. R., G. Ito, and S. J. Martel, Effects of volcano loading on dike propagation in an elastic half-space, *J. Geophys. Res.*, *106*, 11,101–11,113, 2001.
- Müller, R. D., W. R., Roest, J. Y. Royer, L. M. Gahagan, and J. G. Sclater, Digital isochrons of the world’s ocean floor, *J. Geophys. Res.*, *102*, 3211–3214, 1997.
- Murakami, M., M. Tobita, S. Fujiwara, T. Saito, and H. Masaharu, Coseismic crustal deformations of 1994 Northridge, California, earthquake detected by interferometric JERS 1 synthetic aperture radar, *J. Geophys. Res.*, *101*, 8605–8614, 1996.
- Myers, S., S. Beck, G. Zandt, and T. Wallace, Lithospheric-scale structure across the Bolivian Andes from tomographic images of velocity and attenuation for *P* and *S* waves, *J. Geophys. Res.*, *103*, 21,233–21,252, 1998.

- Naranjo, J. A., Sulphur flows at Lastarria volcano in the north Chilean Andes, *Nature*, *313*, 778–780, 1985.
- Naranjo, J. A., and P. Francis, High velocity debris avalanche at Lastarria volcano in the north Chilean Andes, *Bull. Volcanol.*, *49*, 509–514, 1987.
- Newhall, C. G., and D. Dzurisin, Historical unrest at large calderas of the world, in *USGS Bulletin*, vol. 1855, p. 1108, USGS Washington, D.C., 1988.
- Nishimura, T., S. Miura, K. Tachibana, K. Hashimoto, T. Sato, S. Hori, E. Murakami, T. Kono, K. Nida, M. Mishina, T. Hirasawa, and S. Miyazaki, Distribution of seismic coupling on the subducting plate boundary in northeastern Japan inferred from GPS observations, *Tectonophysics*, *323*, 217–238, 2000.
- Nishimura, T., S. Fujiwara, M. Murakami, M. Tobita, H. Nakagawa, T. Sagiya, and T. Tada, The M6.1 earthquake triggered by volcanic inflation of Iwate volcano, northern Japan, observed by satellite radar interferometry, *Geophys. Res. Lett.*, *28*, 635–638, 2001.
- Norabuena, E., L. Leffler-Griffin, A. Mao, T. Dixon, S. Stein, I. S. Sacks, L. Ocola, and M. Ellis, Space geodetic observations of Nazca-South America convergence across the central Andes, *Science*, *279*, 358–362, 1998.
- Norabuena, E., T. Dixon, I. Sacks, and S. Stein, Coseismic displacement field of the June 23, 2001 Peru earthquake, *Eos Trans. AGU*, *76*, 427, 2001.
- Ohkura, H., Application of SAR data to monitoring Earth surface changes and displacement, *Adv. Space Res.*, *21*, 485–492, 1998.
- Okada, Y., Surface deformation due to shear and tensile faults in a half-space, *Bull. Seismol. Soc. Am.*, *75*, 1135–1154, 1985.
- Okal, E., S. Araya, J. Borrero, L. Dengler, B. Gomer, S. Koshimura, G. Laos, D. Olcese, M. F. Ortiz, M. Swensson, V. Titov, and F. Vegas, The Peruvian tsunami

- of 23 June 2001: Preliminary report by the International Tsunami Survey Team, *Eos Trans. AGU*, 76, 427, 2001.
- Oleskevich, D. A., R. D. Hyndman, and K. Wang, The updip and downdip limits to great subduction earthquakes: Thermal and structural models of Cascadia, south Alaska, SW Japan, and Chile, *J. Geophys. Res.*, 104, 14,965–14,991, 1999.
- Oppenheimer, C., P. W. Francis, D. A. Rothery, and R. W. T. Carlton, Infrared image analysis of volcanic thermal features: Lascar Volcano, Chile 1984-1992, *J. Geophys. Res.*, 98, 4269–4286, 1993.
- Ortlieb, L., S. Barrientos, J. C. Ruegg, N. Guzman, and A. Lavenu, Coseismic coastal uplift during the 1995 Antofagasta earthquake, in *I.G.C.P. project 367: Late Quaternary coastal records of rapid change*, pp. 54–57, IInd Annual Meeting, Antofagasta, Chile, Abstract vol., 1995.
- Ortlieb, L., S. Barrientos, and N. Guzman, Coseismic coastal uplift and coralline algae record in northern Chile: The 1995 Antofagasta earthquake case, *Quat. Sci. Rev.*, 15, 949–960, 1996.
- Ozawa, S., M. Murakami, S. Fujiwara, and M. Tobita, Synthetic aperture radar interferogram of the 1995 Kobe earthquake and its geodetic inversion, *Geophys. Res. Lett.*, 24, 2327–2330, 1997.
- Ozawa, S., M. Murakami, and T. Tada, Time-dependent inversion study of the slow thrust event in the Nankai trough subduction zone, southwestern Japan, *J. Geophys. Res.*, 106, 787–802, 2001.
- Ozawa, S., M. Murakami, M. Kaidzu, T. Tada, T. Sagiya, Y. Hatanaka, H. Yarai, and T. M. Nishimura, Detection and monitoring of ongoing aseismic slip in the Tokai region, central Japan, *Science*, 298, 1009–1012, 2002.
- Pacheco, J. F., L. R. Sykes, and C. H. Scholz, Nature of seismic coupling along simple plate boundaries of the subduction type, *J. Geophys. Res.*, 98, 14,133–14,159, 1993.

- Parsons, T., S. Toda, R. S. Stein, A. Barka, and J. H. Dieterich, Heightened odds of large earthquakes near Istanbul: An interaction-based probability calculation, *Science*, *288*, 661–665, 2000.
- Patzwahl, R., J. Mechie, A. Schulze, and P. Giese, Two-dimensional velocity models of the Nazca plate subduction zone between 19.5°S and 25°S from wide-angle seismic measurements during the CINCA95 project, *J. Geophys. Res.*, *104*, 7293–7317, 1999.
- Peltzer, G., P. Rosen, P. Rogez, and P. Hudnut, Postseismic rebound in fault stepovers caused by pore fluid flow, *Science*, *273*, 1202–1204, 1996.
- Peltzer, G., P. A. Rosen, F. Rogez, and H. K., Poroelastic rebound along the Landers 1992 earthquake surface rupture, *J. Geophys. Res.*, *103*, 30,131–30,145, 1998.
- Peltzer, G., F. Crampe, S. Hensley, and P. Rosen, Transient strain accumulation and fault interaction in the eastern California shear zone, *Geology*, *29*, 975–978, 2001.
- Peterson, E. T., and T. Seno, Factors affecting seismic moment release rates in subduction zones, *J. Geophys. Res.*, *89*, 10,233–10,248, 1984.
- Press, W. H., S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, *Numerical Recipes in FORTRAN: the art of scientific computing*, Cambridge University Press, New York, 1994.
- Price, E. J., Coseismic and postseismic deformations associated with the 1992 Landers, California, earthquake measured by synthetic aperture radar interferometry, Ph.D. thesis, University of California, San Diego, San Diego, CA, 1999.
- Price, E. J., Elements of the active magmatic system of Seguam Island, Aleutian Islands, Alaska inferred from co and post-eruptive surface deformation spanning 1993-2000, *Eos*, *83*, 1382, 2002.
- Pritchard, M. E., and M. Simons, A satellite geodetic survey of large-scale deformation of volcanic centres in the central Andes, *Nature*, *418*, 167–171, 2002.

- Pritchard, M. E., M. Simons, R. Lohman, P. Rosen, and F. Webb, Constraints on crustal deformation in northern Chile using interferometric synthetic aperture radar, *Eos Trans. AGU*, 79, 184, 1998.
- Pritchard, M. E., M. Simons, P. Rosen, S. Hensley, and F. Webb, Co-seismic slip from the 1995 July 30 $M_w=8.1$ Antofagasta, Chile, earthquake as constrained by InSAR and GPS observations, *Geophys. J. Int.*, 150, 362–376, 2002.
- Puglisi, G., and M. Coltelli, SAR interferometry applications on active volcanoes: State of the art and perspectives for volcano monitoring, *Il Nuovo Cimento*, 24, 133–145, 2001.
- Pyle, D. M., Mass and energy budgets of explosive volcanic eruptions, *Geophys. Res. Lett.*, 22, 563–566, 1995.
- Ramirez, J., H. Titichoca, J. F. Lander, and L. S. Whiteside, The minor destructive tsunami occurring near Antofagasta, Northern Chile, July 30, 1995, *Science of Tsunami Hazards*, 15, 3–22, 1997.
- Reigber, C., G. W. Michel, J. Klotz, and D. Angermann, The Antofagasta 1995 earthquake: Crustal deformation pattern as observed by GPS and D-INSAR, in *Proceedings of ERS symposium on Space at the service of our environment, Florence, Italy*, vol. 414, pp. 507–513, 1997.
- Rice, J. R., and M. P. Cleary, Some basic stress diffusion solutions for fluid-saturated elastic porous media with compressible constituents, *Rev. Geophys.*, 14, 227–241, 1976.
- Riller, U., I. Petrinovic, J. Ramelow, M. Strecker, and O. Oncken, Late Cenozoic tectonism, collapse caldera and plateau formation in the central Andes, *Earth Planet. Sci. Lett.*, 188, 299–311, 2001.
- Roeloffs, E., Poroelastic techniques in the study of earthquake-related hydrologic phenomena, in *Adv. Geophys.*, edited by R. Dmowska and B. Saltzman, vol. 37, pp. 135–195, Academic Press, 1996.

- Rosen, P. A., S. Hensley, H. A. Zebker, F. H. Webb, and E. J. Fielding, Surface deformation and coherence measurements of Kilauea Volcano, Hawaii, from SIR-C radar interferometry, *J. Geophys. Res.*, *101*, 23,109–23,125, 1996.
- Rosen, P. A., S. Hensley, I. R. Joughin, F. K. Li, S. N. Madsen, E. Rodríguez, and R. M. Goldstein, Synthetic Aperture Radar Interferometry, *Proceedings of the IEEE*, *88*, 333–382, 2000.
- Rothman, D. H., Automatic estimation of large residual statics corrections, *Geophysics*, *51*, 337–346, 1986.
- Rubin, A. M., and D. Gillard, Aftershock asymmetry/rupture directivity among central San Andreas fault microearthquakes, *J. Geophys. Res.*, *105*, 19,095–19,109, 2000.
- Ruegg, J. C., J. Campos, R. Armijo, S. Barrientos, P. Briole, R. Thiele, M. Arancibia, J. Canuta, T. Duquesnoy, M. Chang, D. Lazo, H. Lyon-Caen, L. Ortlieb, J. C. Rossignol, and L. Serrurier, The $M_w=8.1$ Antofagasta (North Chile) earthquake July 30, 1995: First results from teleseismic and geodetic data, *Geophys. Res. Lett.*, *23*, 917–920, 1996.
- Ruegg, J. C., M. Olcay, and D. Lazo, Co-, post- and pre(?) seismic displacements associated with the $M_w=8.4$ southern Peru earthquake of 23 June 2001 from continuous GPS measurements, *Seismol. Res. Lett.*, *72*, 683–678, 2001.
- Ruff, L. J., and B. W. Tichelaar, What controls the seismogenic plate interface in subduction zones?, in *Subduction: Top to Bottom*, edited by G. E. Bebout, D. W. Scholl, S. H. Kirby, and J. P. Platt, Geophysical Monograph 96, pp. 105–111, AGU, 1996.
- Ruff, L. J., J. W. Given, C. O. Sanders, and C. M. Sperber, Large earthquakes in the Macquarie Ridge complex: Transitional tectonics and subduction initiation, *Pure Appl. Geophys.*, *129*, 71–130, 1989.

- Rymer, A., and G. Schubert, Phanerozoic addition rates to the continental crust and crustal growth, *Tectonics*, *3*, 63–77, 1984.
- Rymer, H., J. B. Murray, G. C. Brown, F. Ferrucci, and W. J. McGuire, Mechanisms of magma eruption and emplacement at Mt. Etna between 1989 and 1992, *Nature*, *361*, 439–441, 1993.
- Sagiya, T., and W. Thatcher, Coseismic slip resolution along a plate boundary megathrust: The Nankai Trough, southwest Japan, *J. Geophys. Res.*, *104*, 1111–1129, 1999.
- Salichon, J., B. Delouis, P. Lundgren, D. Giardini, M. Constantini, and P. Rosen, Joint inversion of broadband teleseismic and interferometric synthetic aperture radar (InSAR) data for the slip history of the $M_w = 7.7$, Nazca ridge (Peru) earthquake of 12 November 1996, *J. Geophys. Res.*, *108*, 10.1029/2001JB000913, 2003.
- Sambridge, M., Exploring multi-dimensional landscapes without a map, *Inverse Problems*, *14*, 427–440, 1998.
- Sambridge, M., Geophysical inversion with a neighbourhood algorithm - I. Searching a parameter space, *Geophys. J. Int.*, *138*, 479–494, 1999a.
- Sambridge, M., Geophysical inversion with a neighbourhood algorithm - II. Appraising the ensemble, *Geophys. J. Int.*, *138*, 727–746, 1999b.
- Sambridge, M., Finding acceptable models in nonlinear inverse problems using a neighbourhood algorithm, *Inverse Problems*, *17*, 387–403, 2001.
- Sambridge, M. S., and B. L. N. Kennett, A novel method of hypocentre location, *Pure Appl. Geophys.*, *158*, 241–257, 2001.
- Sandwell, D. T., and E. J. Price, Phase gradient approach to stacking interferograms, *J. Geophys. Res.*, *103*, 30,183–30,204, 1998.
- Satake, K., Depth distribution of coseismic slip along the Nankai Trough, Japan, from joint inversion of geodetic and tsunami data, *J. Geophys. Res.*, *98*, 4553–3565, 1993.

- Sato, T., and M. Matsu'ura, Cyclic crustal movement, steady uplift of marine terraces, and evolution of the island arc-trench system in southwest Japan, *Geophys. J. Int.*, *111*, 617–629, 1992.
- Savage, J. C., A dislocation model of strain accumulation and release at a subduction zone, *J. Geophys. Res.*, *88*, 4984–4996, 1983.
- Scharroo, R., P. N. A. M. Visser, and G. J. Mets, Precise orbit determination and gravity field improvement for the ERS satellites, *J. Geophys. Res.*, *103*, 8113–8127, 1998.
- Schilling, F. R., G. M. Partzch, H. Brasse, and G. Schwarz, Partial melting below the magmatic arc in the central Andes deduced from geoelectromagnetic field experiments and laboratory data, *Phys. Earth Planet. Inter.*, *103*, 17–31, 1997.
- Schmidt, D., The kinematics of faults in the San Francisco bay area inferred from geodetic and seismic data, Ph.D. thesis, University of California, Berkeley, Berkeley, CA., 2002.
- Schmitz, M., W.-D. Heinsohn, and F. R. Schilling, Seismic, gravity and petrological evidence for partial melt beneath the thickened central Andean crust (21-23°S), *Tectonophysics*, *205*, 127–140, 1997.
- Scholz, C. H., *The mechanics of earthquakes and faulting*, Cambridge University Press, New York, 1990.
- Scholz, C. H., Earthquakes and friction laws, *Nature*, *391*, 37–42, 1998.
- Scholz, C. H., and J. Campos, On the mechanism of seismic decoupling and back-arc spreading at subduction zones, *J. Geophys. Res.*, *100*, 22,103–22,115, 1995.
- Schweller, W. J., L. D. Kulm, and R. A. Prince, Tectonics, structure, and sedimentary framework of the Peru-Chile trench, *GSA Mem.*, *154*, 323–349, 1981.
- Segall, P., and J. L. Davis, GPS applications for geodynamics and earthquake studies, *Ann. Rev. Earth Planet. Sci.*, *25*, 301–336, 1997.

- Segall, P., and R. Harris, Earthquake deformation cycle on the San Andreas Fault near Parkfield, California, *J. Geophys. Res.*, *92*, 10,511–10,525, 1987.
- Sen, M. K., and P. L. Stoffa, *Global optimization methods in geophysical inversion*, Elsevier Science, Amsterdam, The Netherlands, 1995.
- Sigmundsson, F., H. Vadon, and D. Massonnet, Readjustment of the Krafla spreading segment to crustal rifting measured by satellite radar interferometry, *Geophys. Res. Lett.*, *24*, 1843–1846, 1997.
- Sigmundsson, F., P. Durand, and D. Massonnet, Opening of an eruptive fissure and seaward displacement at Piton de la Fournaise volcano measured by RADARSAT satellite radar interferometry, *Geophys. Res. Lett.*, *26*, 533–536, 1999.
- Simkin, T., and L. Siebert, *Volcanoes of the world*, Geoscience Press, Tucson, 1994.
- Simons, M., P. Rosen, and F. Webb, Observations of plate boundary deformation using InSAR, *Eos Trans. AGU*, *77*, 1996.
- Simons, M., Y. Fialko, and L. Rivera, Coseismic deformation from the 1999 M_w 7.1 Hector Mine, California, earthquake as inferred from InSAR and GPS observations, *Bull. Seismol. Soc. Am.*, *92*, 1390–1402, 2002.
- Smithsonian Institution, Sabancaya, *Sci. Event Alert Net. Bull.*, *13*, 1988.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, *15*, 1990a.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, *15*, 1990b.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, *15*, 1990c.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, *16*, 1991a.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, *16*, 1991b.
- Smithsonian Institution, Aracar, *Bull. Global Volcanism Network*, *18*, 1993a.
- Smithsonian Institution, Lascar, *Bull. Global Volcanism Network*, *18*, 1993b.

- Smithsonian Institution, Lascar, *Bull. Global Volcanism Network*, 18, 1993c.
- Smithsonian Institution, Nevados Ojos del Salado, *Bull. Global Volcanism Network*, 18, 1993d.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, 19, 1994a.
- Smithsonian Institution, Lascar, *Bull. Global Volcanism Network*, 19, 1994b.
- Smithsonian Institution, Lascar, *Bull. Global Volcanism Network*, 19, 1994c.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, 20, 1995.
- Smithsonian Institution, Ubinas, *Bull. Global Volcanism Network*, 21, 1996a.
- Smithsonian Institution, Guallatiri, *Bull. Global Volcanism Network*, 21, 1996b.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, 22, 1997a.
- Smithsonian Institution, Irruputuncu, *Bull. Global Volcanism Network*, 22, 1997b.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, 23, 1998a.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, 23, 1998b.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, 23, 1998c.
- Smithsonian Institution, Sabancaya, *Bull. Global Volcanism Network*, 25, 2000a.
- Smithsonian Institution, Lascar, *Bull. Global Volcanism Network*, 25, 2000b.
- Smithsonian Institution, Global volcanism report, <http://nmnhwww.si.edu/gvp/>, 2003.
- Sobiesiak, M. M., Fault plane structure of the Antofagasta, Chile earthquake of 1995, *Geophys. Res. Lett.*, 27, 581–584, 2000.
- Sparks, R. S. J., M. C. Gardeweg, E. S. Calder, and S. J. Matthews, Erosion by pyroclastic flows on Lascar Volcano, Chile, *Bull. Volcanol.*, 58, 557–565, 1997.

- Spence, W., C. Mendoza, E. R. Engdahl, G. L. Choy, and E. Norabuena, Seismic subduction of the Nazca Ridge as shown by the 1996-97 Peru earthquakes, *Pure Appl. Geophys.*, *154*, 753–776, 1999.
- Stauder, W., Subduction of the Nazca plate under Peru as evidenced by focal mechanisms and by seismicity, *J. Geophys. Res.*, *80*, 1058–1064, 1975.
- Stern, R. J., Subduction zones, *Rev. Geophys.*, *40*, 10.1029/2001RG000108, 2002.
- Stevens, N. F., J. B. Murray, and G. Wadge, The volume and shape of the 1991-1993 lava flow field at Mount Etna, Sicily, *Bull. Volcanol.*, *58*, 449–454, 1997.
- Suarez, G., and D. Comte, Comment on “Seismic coupling along the Chilean subduction zone” by B. W. Tichelaar and L. R. Ruff, *J. Geophys. Res.*, *98*, 15,825–15,828, 1993.
- Swenson, J. L., and S. L. Beck, Historical 1942 Ecuador and 1942 Peru subduction earthquakes, and earthquake cycles along Colombia-Ecuador and Peru subduction segments, *Pure Appl. Geophys.*, *146*, 67–101, 1996.
- Swenson, J. L., and S. L. Beck, Source characteristics of the 12 November 1996 M_w 7.7 Peru subduction zone earthquake, *Pure Appl. Geophys.*, *154*, 731–751, 1999.
- Tada, T., and M. Hashimoto, Recent crustal deformation around the Aira caldera, Kagoshima, Japan, and its relation to the volcanism of Sakurajima volcano, in *Kagoshima International Conference on Volcanoes, Proceedings*, pp. 284–287, Natl. Inst. for Res. Adv., 1989.
- Tavera, H., and E. Buforn, Source mechanism of earthquakes in Peru, *J. Seismology*, *5*, 519–539, 2001.
- Tavera, H., D. Comte, R. Boroschek, L. Dorbath, D. Portugal, H. H. and H. Montes, I. Bernal, Y. A. and H. Salas, A. Inza, S. Rodriguez, B. Glass, E. Correa, I. Balmaceda, and C. Meneses, Analysis of the 23 June 2001 southern Peru earthquake using locally recorded seismic data, *Eos Trans. AGU*, *76*, 427, 2001.

- Thatcher, W., T. Matsuda, T. Kato, and J. B. Rundle, Lithospheric loading by the 1896 Riku-u earthquake, northern Japan: Implications for plate flexure and asthenospheric rheology, *J. Geophys. Res.*, *85*, 6429–6435, 1980.
- Thatcher, W., G. Marshall, and Lisowski, Resolution of fault slip along the 470-km-long rupture of the great 1906 San Francisco earthquake, *J. Geophys. Res.*, *102*, 5353–5367, 1997.
- Thorpe, R. S., P. W. Francis, and R. S. Harmon, Andean andesites and crustal growth, *Phil. Trans. R. Soc. Lond. A*, *301*, 305–320, 1981.
- Thouret, J.-C., A. Gourgaud, M. Uribe, A. Rodriguez, R. Guillaude, and G. Salas, Geomorphological and geological survey, and SPOT remote sensing of the current activity of Nevado Sabancaya stratovolcano (south Peru): Assessment for hazard-zone mapping, *Zeitschrift Geomorph. N. F.*, *39*, 515–535, 1995.
- Thouret, J.-C., E. Juvigne, A. Gourgaud, P. Boivin, and J. Davila, Reconstruction of the AD 1600 Huaynaputina eruption based on the correlation of geologic evidence with early Spanish chronicles, *J. Volc. Geotherm. Res.*, *115*, 529–570, 2002.
- Tichelaar, B. W., and L. J. Ruff, Seismic coupling along the Chilean subduction zone, *J. Geophys. Res.*, *96*, 11,997–12,022, 1991.
- Tichelaar, B. W., and L. J. Ruff, Reply, *J. Geophys. Res.*, *98*, 15,829–15,831, 1993a.
- Tichelaar, B. W., and L. J. Ruff, Depth of seismic coupling along subduction zones, *J. Geophys. Res.*, *98*, 2017–2037, 1993b.
- Tobita, M., S. Fujiwara, S. Ozawa, P. Rosen, E. Fielding, C. Werner, M. Murakami, H. Nakagawa, and K. Nitta, Deformation of the 1995 North Sakhalin earthquake detected by JERS-1 SAR interferometry, *Earth Planets and Space*, *50*, 313–325, 1998.
- Toksöz, M. N., and S. C. Solomon, Thermal history and evolution of the moon, *The Moon*, *7*, 251–278, 1973.

- Voight, B., R. S. J. Sparks, A. D. Miller, R. C. Stewart, R. P. Hoblitt, A. Clarke, J. Ewart, W. P. Aspinall, B. Baptie, E. S. Calder, P. Cole, T. H. Druitt, C. Hartford, R. A. Herd, P. Jackson, A. M. Lejeune, A. B. Lockhart, S. C. Loughlin, R. Luckett, L. Lynch, G. E. Norton, R. Robertson, I. M. Watson, R. Watts, and S. R. Young, Magma flow instability and cyclic activity at Soufriere Hills volcano, Montserrat, British West Indies, *Nature*, *283*, 1138–1142, 1999.
- Vuille, M., and C. Ammann, Regional snowfall patterns in the high, arid Andes, *Clim. Change*, *36*, 413–423, 1997.
- Wald, D. J., and R. W. Graves, Resolution analysis of finite fault source inversion using one- and three-dimensional Green's functions 2. Combining seismic and geodetic data, *J. Geophys. Res.*, *106*, 8767–8788, 2001.
- Wald, D. J., and T. H. Heaton, Spatial and temporal distribution of slip for the 1992 Landers, California, earthquake, *Bull. Seismol. Soc. Am.*, *84*, 668–691, 1994.
- Waldhauser, F., and W. L. Ellsworth, A double-difference earthquake location algorithm: Method and application to the northern Hayward fault, *Bull. Seismol. Soc. Am.*, *90*, 1353–1368, 2000.
- Wang, H. F., *Theory of linear poroelasticity with applications to geomechanics and hydrogeology*, Princeton University Press, Princeton, NJ, 2000.
- Watanabe, H., S. Okubo, S. Sakashita, and T. Maekawa, Drain-back process of basaltic magma in the summit conduit detected by microgravity observation at Izu-Oshima volcano, Japan, *Geophys. Res. Lett.*, *25*, 2865–2868, 1998.
- Wessel, P., and W. H. F. Smith, New, improved version of Generic Mapping Tools released, *Eos*, *79*, 579, 1998.
- Wicks, C., Jr., W. Thatcher, and D. Dzurisin, Migration of fluids beneath Yellowstone caldera inferred from satellite radar interferometry, *Science*, *282*, 458–462, 1998.

- Wicks, C. W., Jr., D. Dzurisin, S. Ingebritsen, W. Thatcher, Z. Lu, and J. Iverson, Magmatic activity beneath the quiescent Three Sisters volcanic center, central Oregon Cascade Range, USA, *Geophys. Res. Lett.*, *29*, 10.1029/2001GL014205, 2002.
- Wigger, P. J., M. Schmitz, M. Araneda, G. Asch, S. Baldzuhn, P. Giese, W.-D. Heinsohn, E. Martínez, E. Ricaldi, P. Rößler, and J. Viramonte, Variation in crustal structure of the southern central Andes deduced from seismic refraction investigations, in *Tectonics of the southern central Andes: structure and evolution of an active continental margin*, edited by K.-J. Reutter, E. Scheuber, and P. J. Wigger, pp. 23–48, Springer-Verlag, 1994.
- Williams, C. A., and G. Wadge, The effects of topography on magma chamber deformation models: Application to Mt. Etna and radar interferometry, *Geophys. Res. Lett.*, *25*, 1549–1552, 1998.
- Williams, C. A., and G. Wadge, An accurate and efficient method for including the effects of topography in three-dimensional elastic models of ground deformation with applications to radar interferometry, *J. Geophys. Res.*, *105*, 8103–8120, 2000.
- Wooster, M. J., Long-term infrared surveillance of Lascar Volcano: Contrasting activity cycles and cooling pyroclastics, *Geophys. Res. Lett.*, *28*, 847–850, 2001.
- Wooster, M. J., and D. A. Rothery, Thermal monitoring of Lascar Volcano, Chile, using infrared data from the along-track scanning radiometer: A 1992-1995 time series, *Bull. Volcanol.*, *58*, 566–579, 1997.
- Wörner, G., K. Hammerschmidt, F. Henjes-Kunst, J. Lezaun, and H. Wilke, Geochronology ($^{40}\text{Ar}/^{39}\text{Ar}$, K-Ar and He-exposure ages) of Cenozoic magmatic rocks from Northern Chile (18–22°S): Implications for magmatism and tectonic evolution of the central Andes, *Rev. Geol. Chile*, *27*, 205–240, 2000.
- Wright, T., Crustal deformation in Turkey from synthetic aperture radar interferometry, Ph.D. thesis, Oxford University, Oxford, UK, 2000.

- Wu, F. T., and H. Kanamori, Source mechanism of February 4, 1965, Rat Island earthquake, *J. Geophys. Res.*, *78*, 6082–6092, 1973.
- Yagi, Y., M. Kikuchi, and T. Sagiya, Co-seismic slip, post-seismic slip, and aftershocks associated with two large earthquakes in 1996 in Hyuga-nada, Japan, *Earth Planets and Space*, *53*, 793–803, 2001.
- Yang, X.-M., P. M. Davis, and J. H. Dieterich, Deformation from inflation of a dipping finite prolate spheroid in an elastic half-space as a model for volcanic stressing, *J. Geophys. Res.*, *93*, 4249–4257, 1988.
- Yuan, X., S. V. Sobolev, R. Kind, O. Oncken, G. Bock, G. Asch, B. Schurr, F. Graeber, A. Rudloff, W. Hanka, K. Wylegalla, R. Tibi, C. Haberland, A. Rietbrock, P. Giese, P. Wigger, P. Rower, G. Zandt, S. Beck, T. Wallace, M. Pardo, and D. Comte, Subduction and collision processes in the Central Andes constrained by converted seismic phases, *Nature*, *408*, 958–961, 2000.
- Zandt, G., M. Leidig, J. Chmielowski, D. Baumont, and X. Yuan, Seismic detection and characterization of the Altiplano-Puna magma body, central Andes, *Pure Appl. Geophys.*, *160*, 789–807, 2003.
- Zebker, H. A., P. A. Rosen, R. M. Goldstein, A. Gabriel, and C. L. Werner, On the derivation of coseismic displacement-fields using differential radar interferometry – The Landers earthquake, *J. Geophys. Res.*, *99*, 19,617–19,634, 1994.
- Zebker, H. A., P. A. Rosen, and S. Hensley, Atmospheric effects in interferometric synthetic aperture radar surface deformation and topographic maps, *J. Geophys. Res.*, *102*, 7547–7563, 1997.
- Zebker, H. A., F. Amelung, and S. Jonsson, Remote sensing of volcano surface and internal processes using radar interferometry, in *Remote sensing of active volcanism*, edited by P. J. Mougini-Mark, J. A. Crisp, and J. H. Fink, Geophysical Monograph 116, pp. 179–205, AGU, Washington, D. C., 2000.

Zhang, J., and T. Lay, Measuring complex spectra of long-period surface-waves for earthquake source analysis, *Geophys. Res. Lett.*, *16*, 275–278, 1989.

Zhang, Z., and S. Y. Schwartz, Depth distribution of moment release in underthrusting earthquakes at subduction zones, *J. Geophys. Res.*, *97*, 537–544, 1992.