

Emile André Okal

Born: 07 August 1950
Paris, France

Citizenships: United States of America
France

Academic degrees

1971 : Agrégation de Physique, Université de Paris
1972 : Thèse de 3ème cycle [M.S.], Geophysics, Université Paris VI
1978 : Ph.D. Geophysics, California Institute of Technology
1978 : Doctorat d'Etat, Université Paris VII.

Professional experience

1967-1971 : Physics Major, Ecole Normale Supérieure, Paris, France
1971-1974 : Agrégé-Préparateur [Assistant Instructor], Physics,
Ecole Normale Supérieure, Paris, France
1974-1978 : Graduate Research/Teaching Assistant, California Institute of Technology
1975-1977 : Assistant Lecturer in French, California Institute of Technology
1978 : Research Fellow, Seismology, California Institute of Technology
1978-1981 : Assistant Professor, Department of Geology and Geophysics, Yale University
1981-1983 : Associate Professor, Department of Geology and Geophysics, Yale University
1984-1989 : Associate Professor, Department of Geological Sciences, Northwestern University
1989-2016 : Professor, Department of Geological Sciences [*renamed* Earth & Planetary Sciences],
Northwestern University
2016- : Professor *Emeritus*, Department of Earth & Planetary Sciences, Northwestern University

Research Interests

Seismology; Structure of the Earth's interior; Properties of seismic sources;
Plate tectonics; Volcanism; Underwater acoustics; Tsunamis.

Memberships and Professional Service

- Seismological Society of America 1975–
- European Geosciences Union *Life Member*, 2013–
Sergey L. Solov'ev medalist, 2013.
- Incorporated Research Institutions in Seismology
Representative, Northwestern University, 1988-98.
Member, Global Seismological Network Standing Committee, 1989-91; 2008.
- United States Geological Survey Earthquake Hazard Reduction Program,
Member, Peer review panel, 1989–1991.
- National Aeronautics and Space Administration:

Member, Working Group on a Mars Global Seismic Network, 1990–2000.

Member, Solid Earth and Natural Hazards Program peer review panel, 1999.

Member, Discovery Science Review Panel, 2011.

- United Nations Education Science and Culture Organization (UNESCO):
Expert Lecturer to International Institute for Seismology and Earthquake Engineering, Tsukuba, Japan, 1991.
- International Education Science and Culture Organization (UNESCO):
Expert Lecturer to International Institute for Seismology and Earthquake Engineering, Tsukuba, Japan, 1991.
- International Center for Theoretical Physics
Lecturer, International School on Megathrust Earthquakes and Tsunamis, Trieste, 2014
Lecturer, International School on Tsunamis, Hanoi, 2017
Lecturer, International School on Tsunamis, Tunis, 2018
Lecturer, university of Rwanda, Kigali, 2022
- Institut de Physique du Globe de Paris,
Member, External visiting evaluation committee, February, 1992.
- Natural Science and Engineering Research Council of Canada:
Member, Grant Selection Committee, 1995-1998.
- United Nations Educational, Scientific and Cultural Organization
Invited Lecturer, **Les entretiens du XXIème siècle**, Paris, 2005.
- UNESCO Intergovernmental Oceanographic Commission.
Expert Lecturer, International Training Course on Tsunami Numerical Modelling, Kuala Lumpur, 2006; Ostende, 2006; Johannesburg, 2007; Canberra, 2007; Tehran, 2010; Karachi, 2010.
Roger Revelle Medalist, Paris 2024.
- Ocean Studies Board of the U.S. National Academies, 2008–10.
Member, Committee on Tsunami Warning and Preparedness, 2008–2010 [resigned].
- Commissariat à l’Energie Atomique et aux Energies Alternatives, France
Member, External review visiting committee, October 2010.
- National Science Foundation, Division of Civil, Mechanical and Manufacturing Innovation.
Member of Review Panel, 2013.

Editorships

- Associate Editor, *Journal of Geophysical Research*, 1983-85.
- Editor, **PAGEOPH** (*Pure and Applied Geophysics*), 1986-87; *Managing Editor*, 1988-93.
- Editor, **Geophysical Research Letters**, 1993–1995; *Editor-in-Chief*, 1996-1997.
- Member of Editorial Board, *Natural Hazards Journal*, 1987-92
- Member of Editorial Board, *Natural Hazards and Earth System Sciences*, 1999-2002 [founding member].

- Various guest editorships following international symposia

Field Experience

- **Director**, *Midway Island Seismological project*, Midway Island, 1988–1992.
- **Principal Investigator**, *Micronesia Passive Seismic Array*, 4 PASSCAL stations deployed and managed, Federated States of Micronesia and Republic of Nauru, 1994–1996.
- **Member**, *1998 Post Tsunami Investigation and Surveying Team*, Sandaun Province, Papua New Guinea, 1–7 August 1998.
- **Leader**, *1999 Post-Tsunami Investigation and Surveying Team*, Fatu-Hiva, Marquesas, French Polynesia, 2–7 October 1999.
- **Leader**, *2001 Post-Tsunami Investigation and Surveying Team*, Southern Peru, July 2001.
- **Leader**, *1946 Tsunami Investigation and Surveying Team*, Marquesas Islands, French Polynesia, July–August 2000; Austral Islands, December 2001.
- **Member**, *1946 Tsunami Investigation and Surveying Team*, Easter and Juan Fernández Islands, 21 November–02 December 2000; Unimak Island, Alaska, August 2001.
- **Member**, *2002 Post-Tsunami Survey Team*, Isola Stromboli, June 2003.
- **Leader**, *2004 Sumatra Tsunami Investigation and Surveying Team*, Rodrigues and Réunion Islands, March 2005; Madagascar, July–August 2005; Oman, August 2005; Comoros, Sept. 2006 and July 2007; Tanzania, Sept. 2008.
- **Member**, *2004 Sumatra Tsunami Investigation and Surveying Team*, Socotra Island, Yemen, Oct. 2006; South Africa, July 2007; Iran, Oct. 2010.
- **Leader**, *1956 Amorgos, Greece Tsunami Investigation and Surveying Team*, Folegandros, July 2005.
- **Member**, *1956 Amorgos, Greece Tsunami Investigation and Surveying Team*, Aegean Islands, August 2003, July 2004; Turkey, Sept. 2004.
- **Leader**, *2007 Seno Aysen Tsunami International Post Tsunami Survey Team*, Fjord Aysén, Chile, May 2007.
- **Member**, *2009 Samoa International Post Tsunami Survey Team*, American Samoa and Samoa, October 2009; Tonga, November 2009.
- **Leader**, *2010 Maule, Chile International Post Tsunami Survey Team*, Marquesas Islands, March and November 2010.
- **Member**, *1969 Rogue Tsunami Wave Field Survey*, Dwarskersbos, South Africa, September 2010.
- **Leader**, *1945 Makran Tsunami Field Survey*, Southeastern Iran, October 2010.
- **Member**, *2011 Tohoku Tsunami Field Survey*, Jayapura, Papua, Indonesia, July 2011.
- **Leader**, *2012 Mega Boulder Field Survey*, Anaa, French Polynesia, March 2012.
- **Leader**, *1953 Kefallonia, Greece Tsunamis Field Survey*, Ithaka and Kefallonia, Greece, July 2012 and June 2017.
- **Leader**, *1856 Swan Fracture Zone Tsunami Field Survey*, Omoa, Honduras, July 2013.
- **Member**, *1842 Northern Hispaniola Tsunami Field Survey*, Cap Haïtien, Haiti, July 2013.
- **Member**, *1949 Chios Tsunami Field Survey*, Chios, Greece and Çeşmes, Turkey, July 2015.

Student Advising

Ph.D. (Principal advisor)

- **Lisa M. Stewart**, *Strain release along mid-ocean ridge transform faults*, 181 + xiv pp., Yale University, April 1983. *Now with Schlumberger–Doll Research, Ridgefield.*
- † **Bong-Gon Jo**, *Dispersion and attenuation of mantle Rayleigh overtones*, Yale University, 206 + x pp., June 1986. *Was: Professor, Jeobong University, Korea.*
- **Paul R. Lundgren**, *Rupture characteristics of complex earthquakes*, 157 + xiii pp., Northwestern University, July 1988. *Now with Jet Propulsion Laboratory, Pasadena.*
- **Michael E. Wyssession**, *Diffacted seismic waves and the dynamics of the core-mantle boundary*, 190 + xx pp., Northwestern University, May 1991. *Now Professor, Washington University, Saint Louis.*
- **Mark T. Woods**, *Seismic surface wave investigations of three hotspot tracks*, 213 + xix pp., Northwestern University, April 1993. *Now with Air Force Technical Applications Command, Patrick AFB.*
- **Wei-chuang Huang**, *Centroid-moment tensor inversions of analog seismograms from deep earthquakes (1907-1976)*, Northwestern University, 193 + xviii pp., November 1996. *Now with United States Naval Weapons Laboratory, China Lake.*
- **Wm. Philip Richardson**, *Surface-wave tomography of the Ontong-Java Plateau: Seismic probing of the world's largest igneous province*, Northwestern University, 191 + xvi pp., March, 1998. *Now with ChevronTexaco, Houston.*
- **Po-Fei Chen**, *Distribution, origin and implications of seismic stress release in shallow and intermediate-depth subduction systems*, Northwestern University, 149 + xiv pp., December 2002. *Now Associate Professor, National Central University, Jhongli, Taiwan.*
- **Carl W. Ebeling**, *Discriminants and detectors: Seismological studies of tsunami earthquakes and hurricane microseisms*, Northwestern University, 238 pp., September 2012. *Now with IDA Project, University of California, La Jolla.*
- **Amir Salaree**, *Theoretical and computational contributions to the modeling of global tsunamis*, Northwestern University, April 2019. *Now, Research Scientist at Verisk Catastrophe and Risk Solutions, Boston, Massachusetts*
- **Nooshin Saloor**, *Contributions to modern quantifications of seismic sources*, Northwestern University, February 2020. *Then, Post-Doctoral Fellow, Michigan State University, East Lansing.*

Ph.D. (Member of committee and co-advisor)

- * Douglas A. Wiens, Northwestern University, 1985.
- * Joseph F. Engeln, Northwestern University, 1985.
- * Clyde L. Scandrett, Northwestern University, 1985.
- * Isabelle Muszynski, Northwestern University, 1987.
- * Craig R. Bina, Northwestern University, 1987.
- * Stéphane Calmant, Université Paul Sabatier, Toulouse, 1987.
- * D. Charles DeMets, Northwestern University, 1988.
- * Paul R. Stoddard, Northwestern University, 1988.
- * Jonathan M. Lincoln, Northwestern University, 1990.

† Dr. Jo passed away in 2015.

- * George R. Helffrich, III, Northwestern University, 1990.
- * Raymond M. Russo, Northwestern University, 1990.
- * Gary D. Acton, Northwestern University, 1990.
- * Frederic C. Marton, Northwestern University, 1998.
- * Pierre-Franck Piserchia, Université de Nice, Sophia–Antipolis, 1998.
- * Alessio Piatanesi, Institut de Physique du Globe, Paris, 1999.
- * Erin K. Beutel, Northwestern University, 2000.
- * Pierre-Jean Alasset, Université Louis Pasteur, Strasbourg, 2005.
- * Alberto M. López Venegas, Northwestern University, 2006.
- * Giovanni Occhipinti, Institut de Physique du Globe de Paris, 2006.
- * Burak Uslu, University of Southern California, 2007.
- * Laura Swafford, Northwestern University, 2009.
- * Lucie Rolland, Institut de Physique du Globe de Paris, 2010.
- * Dominique Reymond, Université de la Polynésie française, 2010.
- * Laurel Childress, Northwestern University, 2016.
- * Michael Witek, Northwestern University, 2017.
- * Evangelia Flouri, Technical University of Crete, 2017.
- * Jean Coulant, Université de Bretagne Occidentale, 2019.
- * Vassilios Skanavis, University of Southern California, 2020.
- * James Neely, Northwestern University, 2022.
- * Boris Rösler, Northwestern University, 2022.
- * Thifhelimbilu Faith Mulabisana, Université de Strasbourg, 2022.

Habilitation [~ D.Sc.] (Member of committee and co-advisor)

- * Narcisse Zahibo, Université des Antilles–Guyane, 2004.
- * Hélène Hébert, Université Pierre-et-Marie Curie, 2012.

Invited Seminars

At least **254** talks over **51** years at **121** institutions located in **29** countries and territories.

Outside Funding

Approximately **\$4 million** raised over the past 35 years from *NSF, ONR, NASA, USGS, PRF, UNESCO*, etc.

Classes Taught at Northwestern

Over my 42 years at Northwestern, I have taught the following classes
(or their equivalent under different indices)

103 *Geological Hazards*

107 *Plate Tectonics*

110 *Introduction to the Solar System -- The Earth as a Planet*

202 *The Body of the Earth*

320 *Global Tectonics*

324 *Introductory Seismology*

350 *Physics of the Earth -- for the I.S.P.*

438 *Advanced Topics in Geophysics*

462 *Advanced Topics in Seismology*, the latter rotating among five different topics.

Languages

- *French*: Mother Tongue
- *English*: Fluent
- *Italian*: Excellent
- *Spanish*: Read and heard; spoken fair
- *Slovak*: Read and heard; spoken fair
- *Russian*: Read, heard, spoken, written fair
- * *Various other slavic languages*: read.

Professional Address

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Publications

1. Okal, E., Inhomogénéité du champ magnétique à la surface d'un échantillon ferromagnétique d'épaisseur finie, *C.R. Acad. Sci. Paris*, **269B**, 969-972, 1971.
2. Okal, E., Sur la convergence de certains développements de sismogrammes synthétiques obtenus par la méthode de l'eikonal, *C.R. Acad. Sci. Paris*, **272B**, 569-571, 1972.
3. Okal, E., Problèmes posés par l'application de la théorie de l'eikonal à la Sismologie, *Thèse de Troisième cycle*, Université Paris VI et Ecole Normale Supérieure, 115 pp., Paris, 1972.
4. Okal, E., and P. Mechler, On the problem of the convergence of the eikonal expansion for synthetic seismograms, *Bull. Seismol. Soc. Amer.*, **63**, 1315-1319, 1973.
5. Mechler, P., R. M'seddi, E. Okal, J.-L. Plantet and Y. Rocard, Investigation of the 600-km discontinuity under France through travel-time and amplitude anomalies, *Phys. Earth Planet. Inter.*, **8**, 269-274, 1974.
6. Okal, E., and G. Kuster, A teleseismic array study in French Polynesia: implications for local and distant structures, *Geophys. Res. Lett.*, **2**, 5-8, 1975.
7. Okal, E., and D.L. Anderson, On the planetary theory of sunspots, *Nature*, **253**, 511-513, 1975.
8. Okal, E., and D.L. Anderson, A study of lateral inhomogeneity in the upper mantle by multiple *ScS* travel-time residuals, *Geophys. Res. Lett.*, **2**, 313-316, 1975.
9. Okal, E.A., A surface-wave investigation of the rupture mechanism of the Gobi-Altai (December 4, 1957) earthquake, *Phys. Earth Planet. Inter.*, **12**, 319-328, 1976.
10. Okal, E.A., The July 9, and 23, 1905 Mongolian earthquakes: A surface wave investigation, *Earth Plan. Sci. Lett.*, **34**, 326-331, 1977.
11. Okal, E.A., The effect of intrinsic oceanic upper-mantle heterogeneity on the regionalization of long-period Rayleigh wave phase velocities, *Geophys. J. Roy. astr. Soc.*, **49**, 357-370, 1977.
12. Renault, J., and E.A. Okal, Investigating the physical nature of the Coriolis effects in the fixed frame, *Amer. J. Phys.*, **45**, 631-633, 1977.
13. Okal, E.A., and D.L. Anderson, Theoretical models for Mars and their seismic properties, *Icarus*, **33**, 514-528, 1978.
14. Okal, E.A., A physical classification of the Earth's spheroidal modes, *J. Phys. Earth*, **26**, 75-103, 1978.
15. Okal, E.A., Observed very long period Rayleigh wave phase velocities across the Canadian shield, *Geophys. J. Roy. astr. Soc.*, **53**, 663-668, 1978.
16. Stein, S., and E.A. Okal, Seismicity and tectonics of the Ninetyeast Ridge area: evidence for internal deformation of the Indian plate, *J. Geophys. Res.*, **83**, 2233-2245, 1978.
17. Okal, E.A., and R.J. Geller, On the observability of isotropic seismic sources: the July 31, 1970 Colombian earthquake, *Phys. Earth Planet. Inter.*, **18**, 176-196, 1979.
18. Okal, E.A., I. Application of normal mode theory to seismic source and structure problems; II. Seismic investigations of upper mantle lateral heterogeneity, *Ph.D. Thesis*, California Institute of Technology, 249 pp., Pasadena, 1978.
19. Okal, E.A., The July 9 and 23, 1905 Mongolian earthquakes: further comments, *Earth Plan. Sci. Lett.*, **41**, 110, 1978.
20. Okal, E.A., and R.J. Geller, Shear wave velocity at the base of the mantle from profiles of diffracted *SH* waves, *Bull. Seismol. Soc. Amer.*, **69**, 1039-1053, 1979.
21. Okal, E.A., Higher mode Rayleigh waves studied as an individual seismic phase, *Earth Plan. Sci. Lett.*, **43**, 162-167, 1979.
22. Talandier, J., and E.A. Okal, Human perception of *T* waves: the June 22, 1977 Tonga earthquake felt on Tahiti, *Bull. Seismol. Soc. Amer.*, **69**, 1475-1486, 1979.
23. Okal, E.A., J. Talandier, K.A. Sverdrup and T.H. Jordan, Seismicity and tectonic stress in the south-central Pacific, *J. Geophys. Res.*, **85**, 6479-6495, 1980.

24. Okal, E.A., The Bellingshausen Sea earthquake of February 5, 1977: evidence for ridge-generated compression in the Antarctic plate, *Earth Planet. Sci. Lett.*, **46**, 306-310, 1980.
25. Okal, E.A., and J. Talandier, Rayleigh wave dispersion in French Polynesia, *Geophys. J. Roy. astr. Soc.*, **63**, 719-733, 1980.
26. Okal, E.A., On the importance of changes in gravity on seismic recording at ultra-long periods, *Proc. Natl. Acad. Sci. USA*, **78**, 20-21, 1981.
27. Okal, E.A., and J. Talandier, Dispersion of one-second Rayleigh modes through oceanic sediments following shallow earthquakes in the southcentral Pacific Ocean basin, **In: Bottom-Interacting Ocean Acoustics**, W.A. Kuperman and F.B. Jensen, Eds., *NATO Confer. Ser.*, **IV:5**, 345-358, Plenum, New York, 1981.
28. Okal, E.A., and L.M. Stewart, A negative search for an ultra-slow component to the source of the Yunnan earthquakes of May 29, 1976, *Phys. Earth Planet. Inter.*, **26**, 208-216, 1981.
29. Okal, E.A., Intraplate seismicity of Antarctica and tectonic implications, *Earth Plan. Sci. Lett.*, **52**, 397-409, 1981.
30. Okal, E.A., and L.M. Stewart, Slow earthquakes along oceanic fracture zones: evidence for asthenospheric flow away from hotspots? *Earth Plan. Sci. Lett.*, **57**, 75-87, 1982.
31. Okal, E.A., Higher moment excitation of normal modes and surface waves, *J. Phys. Earth*, **30**, 1-31, 1982.
32. Nataf, H.-C., T. Lay, D.L. Anderson and E.A. Okal, Reassessment of a reported S-delay under Trindade, *Geophys. Res. Lett.*, **8**, 1027-1030, 1981.
33. Talandier, J., et E.A. Okal, Crises sismiques au volcan Macdonald (Océan Pacifique Sud), *C.R. Acad. Sci. Paris, Sér. II.*, **295**, 195-200, 1982.
34. Sailor, R.V., and E.A. Okal, Application of SEASAT data in seismotectonic studies of the southcentral Pacific, *J. Geophys. Res.*, **88**, 1572-1580, 1983.
35. Okal, E.A., Listening to the Earth's music, *Perspectives in Computing*, **2:(2)**, 28-39, 1982.
36. Okal, E.A., Mode-wave equivalence and other asymptotic problems in tsunami theory, *Phys. Earth Planet. Inter.*, **30**, 1-11, 1982.
37. Okal, E.A., and B.-G. Jo, Regional dispersion of first order overtone Rayleigh waves, *Geophys. J. Roy. astr. Soc.*, **72**, 461-481, 1983.
38. Okal, E.A., Oceanic intraplate seismicity, *Annu. Rev. Earth Planet. Sci.*, **11**, 195-214, 1983.
39. Okal, E.A., and J.-M. Bergeal, Mapping the Miocene Farallon Ridge jump on the Pacific plate: a seismic line of weakness, *Earth Plan. Sci. Lett.*, **63**, 113-122, 1983.
40. Stewart, L.M., and E.A. Okal, Seismicity and aseismic slip along the Eltanin Fracture Zone, *J. Geophys. Res.*, **88**, 10495-10507, 1983.
41. Lay, T., and E.A. Okal, The Gilbert Islands (Republic of Kiribati) Earthquake Swarm of 1981-83, *Phys. Earth Planet. Inter.*, **33**, 284-303, 1983.
42. Talandier, J., and E.A. Okal, The volcanoseismic swarms of 1981-1983 in the Tahiti-Mehetia area, French Polynesia, *J. Geophys. Res.*, **89**, 11216-11234, 1984.
43. Okal, E.A., Intraplate Seismicity of the Southern part of the Pacific plate, *J. Geophys. Res.*, **89**, 10053-10071, 1984.
44. Talandier, J., and E.A. Okal, New surveys of Macdonald Seamount, Southcentral Pacific, following volcanoseismic activity, 1977-1983, *Geophys. Res. Lett.*, **11**, 813-816, 1984.
45. Okal, E.A., and A. Cazenave, A Model for the Plate Tectonics Evolution of the Eastcentral Pacific Based on SEASAT Investigations, *Earth Planet. Sci. Lett.*, **72**, 99-116, 1985.
46. Okal, E.A., The Oceanic Lithosphere: Seismology and Tectonics, **In: Internal Geophysics and Space**, edited by A. Cazenave and J.-F. Minster, Centre National d'Etudes Spatiales, pp. 341-368, Cepadues-Editions, Toulouse, 1985.
47. Cazenave, A., and E.A. Okal, Use of satellite altimetry in studies of the oceanic lithosphere, **In: Space Geodesy and Geodynamics**, edited by A.J. Anderson and A. Cazenave, pp. 347-375, Academic Press, London, 1986.

48. Stein, S., and E.A. Okal, Seismological Studies of the Deformation of oceanic lithosphere, **In: *Space Geodesy and Geodynamics***, edited by A.J. Anderson and A. Cazenave, pp. 407-450, Academic Press, London, 1986.
49. Okal, E.A., and B.-G. Jo, Stacking Investigations of Higher-order Mantle Rayleigh Waves, *Geophys. Res. Letts.*, **12**, 421-424, 1985.
50. Okal, E.A., and J. Talandier, *T*-wave duration, magnitudes and seismic moment of an earthquake; application to tsunami warning, *J. Phys. Earth*, **34**, 19-42, 1986.
51. Stein, S., E.A. Okal, and D.A. Wiens, Application of Modern Techniques to Analysis of Historical Earthquakes, **In: *Historical Seismograms and Earthquakes of the World***, edited by W.H.K. Lee, H. Meyers and K. Shimazaki, pp. 85-104, Academic Press, London, 1987.
52. Okal, E.A., D.F. Woods, and T. Lay, Intraplate deformation in the Samoa—Gilbert—Ralik area: a prelude to a change of plate boundaries in the Southwest Pacific?, *Tectonophysics*, **132**, 69-78, 1986.
53. Talandier, J., and E.A. Okal, Crustal structure in the Tuamotu and Society Islands, French Polynesia, *Geophys. J. Roy. astr. Soc.*, **88**, 499-528, 1987.
54. Okal, E.A., and B.-G. Jo, Stacking Investigations of the Dispersion of Higher Order Mantle Rayleigh Waves and Normal Modes, *Phys. Earth Planet. Inter.*, **47**, 188-204, 1987.
55. Talandier, J., and E.A. Okal, Seismic detection of underwater volcanism: the example of French Polynesia, *Pure Appl. Geophys.*, **125**, 919-950, 1987.
56. Wiens, D.A., and E.A. Okal, Tensional Intraplate Seismicity in the Eastcentral Pacific, *Phys. Earth Planet. Inter.*, **49**, 264-282, 1987.
57. Okal, E.A., and S. Stein, The 1942 Southwest Indian Ocean Ridge Earthquake: Largest ever recorded on an oceanic transform, *Geophys. Res. Letts.*, **14**, 147-150, 1987.
58. Okal, E.A., and R. Batiza, Hotspots: the first 25 years, **In: *Seamounts, Islands and Atolls, A Memorial to Henry William Menard***, Edited by B. Keating, P. Fryer, R. Batiza and G. Boehlert, *American Geophysical Union Monograph*, **43**, 1-11, 1987.
59. Rees, B.A., and E.A. Okal, The depth of the deepest historical earthquakes, *Pure Appl. Geophys.*, **125**, 699-715, 1987.
60. Lundgren, P.R., E.A. Okal and S. Stein, Body wave deconvolution for variable source parameters, application to the December 6, 1978 Kuriles earthquake, *Geophys. J.*, **94**, 171-180, 1988.
61. Okal, E.A., and J. Talandier, M_m : Theory of a variable-period mantle magnitude, *Geophys. Res. Letts.*, **14**, 836-839, 1987.
62. Talandier, J., D. Reymond and E.A. Okal, M_m : Use of a variable-period mantle magnitude for the rapid one-station estimation of teleseismic moments, *Geophys. Res. Letts.*, **14**, 840-843, 1987.
63. Woods, M.T., and E.A. Okal, Effect of variable bathymetry on the amplitude of teleseismic tsunamis: a ray-tracing experiment, *Geophys. Res. Letts.*, **14**, 765-768, 1987.
64. Okal, E.A., and B.-G. Jo, Q measurements for Phase X overtones, *Pure Appl. Geophys.*, **132**, 331-362, 1990.
65. Okal, E.A., Seismic parameters controlling far-field tsunami amplitudes: A review, *Natural Hazards*, **1**, 67-96, 1988.
66. Okal, E.A., Introduction [to Special Issue on Volcanic Seismology], *Pure Appl. Geophys.*, **125**, 881-882, 1987.
67. Wyssession, M.E., and E.A. Okal, Evidence for lateral heterogeneity at the core-mantle boundary from the slowness of diffracted S profiles, **In: *Structure and Dynamics of Earth's Deep Interior***, Edited by D.E. Smylie and R. Hide, *American Geophysical Union, Geophys. Monog.*, **46**, pp. 55-63, 1988.
68. Lundgren, P.R., and E.A. Okal, Slab decoupling in the Tonga arc: the June 22, 1977 earthquake, *J. Geophys. Res.*, **93**, 13355-13366, 1988.
69. Okal, E.A., and J. Talandier, M_m : A variable period mantle magnitude, *J. Geophys. Res.*, **94**, 4169-4193, 1989.

70. Okal, E.A., A theoretical discussion of time-domain magnitudes: the Prague formula for M_s and the mantle magnitude M_m , *J. Geophys. Res.*, **94**, 4194-4204, 1989.
71. Talandier, J., and E.A. Okal, An algorithm for automated tsunami warning in French Polynesia, based on mantle magnitudes, *Bull. Seismol. Soc. Amer.*, **79**, 1177-1193, 1989.
72. Lundgren, P.R., E.A. Okal and D.A. Wiens, Rupture characteristics of the 1982 Tonga and 1986 Kermadec earthquakes, *J. Geophys. Res.*, **94**, 15521-15539, 1989.
73. Wyssession, M.E., and E.A. Okal, Regional analysis of D'' velocities from the ray parameters of diffracted P profiles, *Geophys. Res. Letts.*, **16**, 1417-1420, 1989.
74. Okal, E.A., M_m : A mantle wave magnitude for intermediate and deep earthquakes, *Pure Applied Geophys.*, **134**, 333-354, 1990.
75. Okal, E.A., and J. Talandier, M_m : Extension to Love waves of the concept of a variable-period mantle magnitude, *Pure Applied Geophys.*, **134**, 355-384, 1990.
76. Wyssession, M.E., E.A. Okal, and K.L. Miller, Intraplate seismicity of the Pacific Basin, 1913-1988, *Pure Appl. Geophys.*, **135**, 261-359, 1991.
77. Russo, R.M., R.C. Speed, E.A. Okal, J.B. Shepherd, and K.C. Rowley, Seismicity and tectonics of the Southeastern Caribbean, *J. Geophys. Res.*, **98**, 14299-14319, 1993.
78. Woods, M.T., J.-J. L  v  que, E.A. Okal, and M. Cara, Two-station measurements of Rayleigh wave group velocity along the Hawaiian swell, *Geophys. Res. Letts.*, **18**, 105-108, 1991.
79. Okal, E.A., Single forces and double-couples: A theoretical review of their relative efficiency for the excitation of seismic and tsunami waves, *J. Phys. Earth*, **38**, 445-474, 1990.
80. Okal, E.A., Introduction [to special issue on "Aspects of Pacific Seismicity"], *Pure Appl. Geophys.*, **135**, 167-168, 1991.
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