03/13/08

CURRICULUM VITAE

LEE-LUENG FU

Jet Propulsion Laboratory, M/S 300-323
4800 Oak Grove Drive, Pasadena, CA 91109

Telephone: Office: (818) 354-8l67; Home: (818) 790-6122
FAX: (818)-393-6720; E-Mail: llf@pacific.jpl.nasa.gov

CITIZENSHIP: U.S.
DATE OF BIRTH: October 10,1950

EDUCATION

1980: Ph.D. in Physical Oceanography, Joint Program in Oceanography, Massachusetts Institute of Technology-Woods Hole Oceanographic Institution.

l972: B.S. in Physics, National Taiwan University, Taipei, Taiwan

PROFESSIONAL EXPERIENCE

Research and Administrative Positions

1994-present: Senior Research Scientist, Jet Propulsion Laboratory
1994-2005: Lead Scientist, Ocean Science Element, Jet Propulsion Laboratory
1986-1994: Group Supervisor, Physical Oceanography Group, Jet Propulsion Laboratory
1981-1986: Member of Technical Staff, Jet Propulsion Laboratory
l980: Postdoctoral Associate, Dept. of Earth and Planetary Sciences, Massachusetts Institute of Technology

Project/Program Positions:

2002-present: Ocean Surface Topography Mission/Jason-2 Project Scientist, Jet Propulsion Laboratory
1998-present: Jason Project Scientist, Jet Propulsion Laboratory
1988-2006: TOPEX/Poseidon Project Scientist, Jet Propulsion Laboratory

Visiting Positions:

2002 – 2004: Visiting Professor, Ocean University of China, Qingdao, China

HONORS and CITATIONS

Member, National Academy of Engineering, 2008
2006 Space Systems Team Award, American Institute of Aeronautics and Astronautics
Editor Award, American Meteorological Society, 2005
NASA Outstanding Leadership Medal, 2004

Fellow, American Geophysical Union, 2003
Fellow, American Meteorological Society, 2003
Verner E. Suomi Award, American Meteorological Society, 2002.
NASA Exceptional Scientific Achievement Medal, 1996
Aviation Week and Space Technology Annual Laurel Award , 1994
NASA Exceptional Achievement Medal, 1994
Centre National d'Etudes Spatiales Medal, 1994 (awarded by the French Space Agency)
NASA Group Achievement Award, 1994
JPL Director's Research Achievement Award (Lew Allen Award), 1986

Professional Activities

NASA Ocean Surface Topography Science Team Review Panel, 2008
NASA Ocean Surface Topography Science Team Review Panel, 2004
NASA Physical Oceanography Review Panel, 2002
U.S. World Ocean Circulation Experiment Science Steering Committee, 1998-2002
U.S. Global Ocean Observing System Science Steering Committee, 1998-2000
Jason-1 Science Working Team, Leader, 1997- present
NASA EOS Ocean Panel, 1990-1998
NASA EOS Altimeter Science Team, Leader, 1989-1992
NASA Physical Oceanography Data Active Archive Center Users Working Group, 1989-92
TOPEX/Poseidon Science Working Team, Leader, 1988-2000
NASA EOS Science Steering Committee, 1987-1990
NASA Scatterometer Science Team, 1986-96
WOCE South Atlantic Working Group, 1986
WOCE Heat Flux Working Group, 1986
WOCE Southern Ocean Working Group, 1985
NASA Free-flying Imaging Radar Experiment Working Group, 1980-81

PROFESSIONAL SOCIETIES

American Geophysical Union
American Meteorological Society
The Oceanography Society

Post-docs supervised:

Claire Perigaud, Ichiro Fukumori, Jean-Philippe Boulanger, Randy Brown, Xiaoyun Zang, Cecile Cabanes, Denis Volkov (on going)

PUBLICATIONS (Refereed Articles)

1. Fu, L-L. and G. R. Flierl, 1980: Nonlinear energy and enstrophy transfers in a realistically stratified ocean. *Dynamics of Atmospheres and Oceans,* **4***,* 219-246.

2. Fu, L-L., 1981: Observations and models of inertial waves in the deep ocean. *Reviews of Geophysics and Space Physics,* **19***,* 141-170.

3. Fu, L-L., 1981: The general circulation and meridional heat transport of the subtropical South Atlantic determined by inverse methods. *Journal of Physical Oceanography,* **11***,* 1171-1193.

4. Fu, L-L., T. Keffer, P.P. Niiler, and C. Wunsch, 1982: Observations of mesoscale variability in the western North Atlantic: a comparative study. *Journal of Marine Research,* **40**, 809-848.

5. Fu, L-L., and B. Holt, 1983: Some examples of detection of oceanic mesoscale eddies by the Seasat synthetic-aperture radar. *Journal of Geophysical Research,* **88**, 1844-1852.

6. Fu, L-L., 1983: On the wavenumber spectrum of oceanic mesoscale variability observed by the Seasat altimeter. *Journal of Geophysical Research,* **88**, 4331-4341.

7. Fu, L.-L., 1983: Recent progress in the application of satellite altimetry to observing the mesoscale variability and general circulation of the oceans. *Reviews of Geophysics and Space Physics,* **21**, 1657-1666.

8. Fu, L.-L., and B. Holt, 1984: Internal waves in the Gulf of California: observations from a spaceborne radar. *Journal of Geophysical Research,* **89**, 2053-2060.

9. Fu, L.-L., 1984: Comments on "On the determination of absolute velocities in the ocean" by M.E. Fiadeiro and G. Veronis. *Journal of Marine Research,* **42**, 259-262.

10. Fu, L.-L., and D.B. Chelton, 1984: Temporal variability of the Antarctic Circumpolar Current observed from satellite altimetry. *Science,* **226**, 343-346.

11. Fu, L.-L., and D.B. Chelton, 1985: Observing the large-scale temporal variability of ocean currents by satellite altimetry: with application to the Antarctic Circumpolar Current. *Journal of Geophysical Research,* **90**, 4721-4739.

12. Tai, C.-K., and L.-L. Fu, 1986: On crossover adjustment in satellite altimetry and its oceanographic implications. *Journal of Geophysical Research,* **91**, 2549-2554.

13. Fu, L.-L., 1986: Mass, heat, and freshwater fluxes in the South Indian Ocean. *Journal of Physical Oceanography,* **16**, 1683-1693.

14. Fu, L.-L., J. Vazquez, and M. E. Parke, 1987: Seasonal variability of the Gulf Stream from satellite altimetry. *Journal of Geophysical Research,* **92**, 749-754.

15. Fu, L-L., and J. Vazquez, 1988: On correcting radial orbit errors for altimetric satellites using crossover analysis. *Journal of Atmospheric and Oceanic Technology,* **5**, 466-471.

16. Fu, L.-L., D.B. Chelton, and V. Zlotnicki, 1988: Satellite altimetry: observing ocean variability from space. *Oceanography Magazine,* **1***,* 4-11.

17. Fu, L.-L., and V. Zlotnicki, 1989: Observing oceanic mesoscale eddies from Geosat altimetry: preliminary results. *Geophysical Research Letters*, **16***,* 457-460.

18. Zlotnicki, V., L.-L. Fu, and W. Patzert, 1989: Seasonal variability in global sea level observed with Geosat altimetry. *Journal of Geophysical Research,* **94**, 17959-17969.

19. Vazquez, J., V. Zlotnicki, and L.-L. Fu, 1990: Sea level variabilities in the Gulf Stream between Cape Hatteras and 50° W: A Geosat Study. *Journal of Geophysical Research*, **95**, 17957-17964.

20. Fu, L.-L., W.T. Liu, and M. Abbott, 1990: Satellite remote sensing of the ocean. In "The Sea: Ocean Engineering Science, Vol. 9", edited by B. Le Mehaute and D.M. Hanes, pp.1193-1236, John Wiley & Sons.

21. Fu, L.-L., and R.E. Glazman, 1991: The effect of the degree of wave development on the sea-state bias in radar altimetry measurement. *Journal of Geophysical Research,* **96***,* 829-834.

22. Fu, L.-L., J. Vazquez, and C. Perigaud, 1991: Fitting dynamic models to the Geosat sea level observations in the tropical Pacific Ocean. Part 1: A free wave model. *Journal of Physical Oceanography,* **21***,* 798-809.

23. Holland, W.R., V.Zlotnicki, and L.-L. Fu, 1991: Modelled time dependent flow in the Agulhas retroflection region as deduced from altimeter data assimilation. *South African Journal of Marine Science,* **10***,* 407-427.

24. Fu, L.-L., M. Lefebvre, and E. Christensen, 1991: TOPEX/POSEIDON: The Ocean Topography Experiment. *EOS, Transactions, American Geophysical Union,* **72***,* 369-373.

25. Fu, L.-L., I. Fukumori, and R.N. Miller, 1993: Fitting dynamic models to the Geosat sea level observations in the Tropical Pacific Ocean. Part 2: a linear, wind-driven model. *Journal of Physical Oceanography*, **23**, 2162-2181.

26. Fu, L.-L., and E.J. Christensen, 1993: TOPEX/Poseidon performance evaluated. *Eos, Transactions, American Geophysical Union,* **47**, 297, 302

27. Fukumori, I., L.-L. Fu, and R. N. Miller, 1993: Data assimilation. In "Satellite Remote Sensing of the Oceanic Environment", I.S.F.Jones, Y.Sugimori, R.W.Stewart editors, Seibutsu Kenkyusha, Tokyo, Japan, 528pp.

28. Fu, L.-L., and G. Pihos, 1994: Determining the response of sea level to atmospheric pressure forcing using TOPEX/POSEIDON data. *Journal of Geophysical Research,* **99**, 24633-24642.

29. Fu, L.-L., E. J. Christensen, C.A. Yamarone, M. Lefebvre, Y. Menard, M. Dorrer, and P. Escudier, 1994: TOPEX/POSEIDON Mission Overview. *Journal of Geophysical Research,* **99**, 24369-24381.

30. Fu, L.-L., and R. E. Cheney, 1995: Applications of satellite altimetry to ocean circulation studies:1987-1994. *Review of Geophysics,* **32***, Supplement,*. 213-223.

31. Fu, L.-L., and R.A. Davidson, 1995: A note on the barotropic response of sea level to time-dependent wind forcing. *Journal of Geophysical Research,* **100***,* 24955-24963.

32. Chao, Y., and L.-L. Fu, 1995: A comparison between the TOPEX/POSEIDON data and a global ocean general circulation model during 1992-93. *Journal of GeophysicalResearch,* **100***,* 24965-24976.

33. Yamarone, C.A., E.J. Christensen, and L-L. Fu, 1995: TOPEX/POSEIDON Mission – global measurements of sea level at unprecedented accuracy. *Space Technology – Industrial and commercial applications,* **15(3),** 133-143.

34. Liu, W.T., W. Tang, and L-L. Fu, 1995: Recent warming event in the Pacific may be an El Niño. *Eos, Transactions, American Geophysical Union,* **76**, 429, 437.

35. Fu, L.-L., C. Koblinsky, J-F. Minster, and J. Picaut, 1996: Reflecting on the first three years of TOPEX/POSEIDON. *Eos, Transactions, American Geophysical Union,* **77**, 109, 111, 117.

36. Fu, L.-L., and I. Fukumori, 1996: A case study of the effects of errors in satellite altimetry on data assimilation. In "Modern Approaches to Data Assimilation in Ocean Modeling*",* edited by P. Malanotte-Rizzoi, Elsevier Oceanography Series, **61**, 77-96, Elsevier, New York.

37. Fu, L.-L. 1996: The circulation and its variability of the South Atlantic Ocean: first results from the TOPEX/POSEIDON Mission. In "The South Atlantic: Present and Past Circulation*"*, 63-82, G.Wefer et al., (eds.), Springer-Verlag, 644pp.

38. Boulanger, J-P., and L.-L. Fu, 1996: Evidence of boundary reflection of Kelvin and first-mode Rossby waves from TOPEX/POSEIDON sea level data. *Journal of Geophysical Research,* **101***,* 16361-16371.

39. Fu, L-L., and R.D. Smith, 1996: Global ocean circulation from satellite altimetry and high-resolution computer simulation. *Bulletin of the American Meteorological Society,* **77***,* 2625-2636.

40. Fu, L.-L., and Y. Chao, 1997: The sensitivity of a global ocean model to wind forcing: a test using sea level and wind observations from satellites and operational wind analysis. *Geophysical Research Letters*, **24***,* 1783-1786.

41. Fukumori, I., R. Raghunath, and L.-L. Fu, 1998: The nature of global large-scale sea level variability in relation to atmospheric forcing: A modeling study. *Journal of Geophysical Research*, **103***,* 5493-5512.

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44. Kwok, R., S.H. Yueh, and L.-L. Fu, 1999: Spaceborne radar remote sensing: radar interferometry, scatterometry and altimetry. In "Encyclopedia of Electrical and Electronic Engineering", **20**, J.G. Webster, ed., pp. 15-28, John Wiley & Sons, New York.

45. Fukumori, I., R. Raghunath, L.-L. Fu, and Y. Chao, 1999: Assimilation of TOPEX/Poseidon altimeter data into a global ocean circulation model: How good are the results? *Journal of Geophysical Research*, **104**, 25647-25665.

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47. Ménard, Y., L.-L. Fu, P. Escudier, and G. Kunstmann, 2000 : Cruising the ocean from space with Jason-1 in the 2000's. *Eos, Transactions, American Geophysical Union*, **81**, 381, 390-391.

48. Lee, T., J.-P. Boulanger, A. Foo, L.-L. Fu, R. Giering, 2000: Data assimilation by an intermediate coupled ocean-atmosphere model: application to the 1997-98 El Nino. *Journal of Geophysical Research*, **105**, 26063-26087.

49. Brown, R.G., and L.-L. Fu, 2000: An examination of the spring 1997 mid-latitude east Pacific sea surface temperature anomaly. Atmosphere-Ocean, **38(4),** 577-599.

50. Fu, L.-L., and D.B. Chelton, 2001: Large-scale ocean circulation. In "Satellite Altimetry and Earth Sciences: A Handbook for Techniques and Applications" edited by L.-L. Fu and A. Cazenave, pp. 133-169, Academic Press, San Diego, 423 pp.

51. Chelton, D.B., J. Ries, B. Haines, L.-L. Fu, and P. Callahan, 2001: Satellite altimetry. In "Satellite Altimetry and Earth Sciences: A Handbook for Techniques and Applications" edited by L.-L. Fu and A. Cazenave, pp. 1-131, Academic Press, San Diego, 423 pp.

52. Fu, L-L, B. Cheng, and B. Qiu, 2001: 25-Day period large-scale oscillations in the Argentine Basin revealed by the TOPEX/POSEIDON altimeter. *Journal of Physical Oceanogrography,* **31**, 506-517.

53. Fu, L-L., 2001: Ocean circulation and variability from satellite altimetry. In "Ocean Circulation and Climate" edited by J. Church, G. Siedler, and J. Gould, 141-172, Academic Press, San Diego, Calif.

54. Li, X., Y. Chao, J. C. McWilliams, and L.-L. Fu, 2001: A comparison of two vertical mixing schemes in a Pacific Ocean General Circulation Model. *Journal of Climate*, **14**, 1377-1398.

55. Mitchum, G.T., R. Cheney, L.-L. Fu, C. Le Provost, Y. Menard, and P. Woodworth, 2001: The future of sea surface height observations, In "Observing the Oceans in the 21st Century", edited by C.J. Koblinsky and N.R. Smith, pp. 120-136, Bureau of Meteorology, Melbourne, Australia. 54.

56. Lee, T., I. Fukumori, D. Menemenlis, Z. Xing, and L.-L. Fu, 2002: Effects of the Indonesian Throughflow on the Pacific and Indian Oceans. *Journal of Physical Oceanography*, **32**, 1404-1429.

57. Zang, X., L-L. Fu, and C. Wunsch, 2002: Observed reflectivity of the western boundary of the equatorial Pacific Ocean, *Journal of Geophysical Research,* **107 (C10),** 10.1029/2000JC000719.

58. Fu, L.-L., and B. Qiu, 2002: Interannual variability of the North Pacific Ocean: the roles of boundary-driven and wind-driven baroclinic Rossby waves. *Journal of Geophysical Research*, **107(C12),** 3220, doi:10.1029/2001JC001131.

59. Fu, L.-L., 2003: Wind-forced intraseasonal sea level variability of the extratropical oceans. *Journal of Physical Oceanography*, **33**, 436-449.

60. Fu, L.-L., D. Stammer, R.R. Leben, and D.B. Chelton, 2003: Improved Spatial Resolution of Ocean Surface Topography from the T/P-Jason-1 Altimeter Mission, *Eos, Transactions , American Geophysical Union*, Vol. 84, No. 26, 241-248.

61. Ménard, Y., L-L. Fu, P. Escudier, F. Parisot, J. Perbos, P. Vincent, S. Desai, B. Haines, G. Kunstmann, 2003: The Jason-1 Mission, *Marine Geodesy,* **26**, 131-146.

62. Perbos, J, P. Escudier, F. Parisot, G. Zaouche, P. Vincent, Y. Menard, F. Manon, G. Kunstmann, D. Royer, L.-L. Fu, 2003: Jason-1: Assessment of the system performance, *Marine Geodesy,* **26**, 147-157.

63. Fu, L.-L., 2004: Latitudinal and frequency characteristics of the westward propagation of large-scale oceanic variability, *Journal of Physical Oceanography*, **34**, 1907-1921.

64. Fu, L.-L., and R. Rodriguez, 2004: High-resolution measurement of ocean surface topography by radar interferometry for oceanographic and geophysical applications, AGU Geophysical Monograph 150, IUGG Vol. 19: "State of the Planet: Frontiers and Challenges", R.S.J. Sparks and C.J. Hawkesworth, editors, 209-224.

65. Fu, L.-L., 2004: The interannual variability of the North Atlantic Ocean revealed by combined data from TOPEX/Poseidon and Jason altimetric measurements. *Geophys. Res. Letts.*, Vol. 31, No. 23, L23303, doi10.1029/2004GL021200

66. Tai, C-K, and L.-L. Fu, 2005: 25-Day period large-scale oscillations in the Argentine Basin revisited, *Journal of Physical Oceanography*, **35,** 1473-1479.

67. Song, Y.T., C. Ji, L.-L. Fu, V. Zlotnicki, C. K. Shum, Y.Yi , V. Hjorleifsdottir, 2005: The 26 December 2004 tsunami source estimated from satellite radar altimetry and seismic waves, Geophys. Res. Letts., **32**, L20601, doi:10.1029/2005GL023683

68. Han, W., T. Shinoda, L-L. Fu, and J.P. McCreary, 2006: Impact of atmospheric intraseasonal oscillation on the Indian Ocean dipole during the 1990s, *Journal of Physical Oceanography*, **36**, 670-690.

69. Fu, L.-L., 2006: Pathways of eddies in the South Atlantic revealed from satellite altimeter observations, *Geophysical Research Letters*, 33, L14610, doi:10.1029/2006GL026245

70. Fu, L.-L., and P-Y. Le Traon, 2006: Satellite altimetry and ocean dynamics, Comptes Rendus Geoscience, 338 (14-15): 1063-1076.

71. Fu, L-L., 2007: Intraseasonal basin modes of the equatorial Indian Ocean observed from sea surface height, wind, and temperature data, *Journal of Physical Oceanography,* **37**, 188–202

72. Hughes, C.W., V.N. Stepanov, L-L. Fu, and B. Barnier, 2007: Three modes of variability in Argentine Basin ocean bottom pressure, *Journal of Geophysical Research,* **112**, C01011, doi:10.1029/2006JC003679.

73. Fu, L.-L., 2007: Interaction of mesoscale variability with large-scale waves in the Argentine Basin, *Journal of Physical Oceanography*, **37**, 787–793.

74. Cabanes, C., T. Lee, and L-L. Fu, 2007: Mechanisms of interannual variations of the meridional overturning circulation of the North Atlantic Ocean, *Journal of Physical Oceanography*, Vol. 38, No. 2, 467-480.

75. Alsdorf, D., L-L. Fu, N. Mognard, A. Cazenave, E. Rodriguez, D. Chelton, and D. Letternmaier, 2007: Measuring the Global Oceans and Terrestrial Fresh Water From Space, *Eos, Transactions , American Geophysical Union*, 88 (4), pp. 253, 257.

76. Song, Y. T., L.-L. Fu, V. Zlotnicki, C. Ji, V. Hjorleifsdottir, C.K. Shum, and Y. Yi. 2007 : The role of horizontal impulses of the faulting continental slope in generating the 26 December 2004 Tsunami, *Ocean Modell*. (2007), doi:10.1016/j.ocemod.2007.10.007

Books

Fu, L.-L., and A. Cazenave, editors, 2001: *Satellite Altimetry and Earth Sciences: A Handbook of Techniques and Applications.*, Academic Press, San Diego, 463 pp

Other Publications

1. Fu, L.-L., and C. Wunsch, 1979: Recovery of POLYMODE Array III Clusters A and B, *POLYMODE News*, No. 60, Woods Hole Oceanographic Institution, Woods Hole, Mass.

2. Fu, L.-L. 1980: *Observations and Models of Inertial Waves in the Deep Ocean.* Ph.D. dissertation. Report No. WHOI-80-11, Woods Hole Oceanographic Institution, Woods Hole, Mass. 202 pp.

3. Fu, L-L., and B. Holt, l982: *Seasat Views Oceans and Sea Ice with Synthetic-Aperture Radar,* Publication 81-120, Jet Propulsion Laboratory, Pasadena, CA, 200 pp.

4. Fu, L.-L., 1983: Oceanic Mesoscale Variability and General Circulation from Satellite Altimetry: A Status Report. in *'Aha Huliko'a*, the Proceedings of 1983 Hawaiian Winter Workshop, L. Magaard, P. Muller, and R. Pujalet (editors), pp. 65-85, Department of Oceanography, University of Hawaii at Manoa.

5. Stewart, R.H., L.-L. Fu, and M. Lefebvre , 1986: *Science Opportunities from the Topex/Poseidon Mission*, JPL Publication 86-18, Jet Propulsion Lab., 58pp.

6. Review of "Remote Sensing of Ice and Snow" by D. K. Hall and J. Martinec, in *Arctic, 39*, p. 373, 1986.

7. D. Butler *et al* (26 authors), 1987: *From Pattern to Process: The Strategy of the Earth Observing System,* EOS Science Steering Committee Report, Vol.II, NASA, Washington, DC.

8. Chase, R. , R. Bindschadler, G. Born, L.-L. Fu, P. Mouginis-Mark, C. Parsons, and B. Tapley, 1987: *Altimetric System Panel Report,* Earth Observing System, Vol. IIh, NASA, Washington, DC.

9. Fu, L.-L., 1988: Wet tropospheric correction using FNOC analysis, in *Proceedings of the WOCE/NASA Altimeter algorithm Workshop, Appendix to U.S. WOCE Technical Report No.2*, edited by D. B. Chelton, U.S. WOCE Office, Texas A&M Univ, College Station, Texas.

10. Fu, L.-L., 1988: Inverse barometer effects on altimetric measurements, in *Proceedings of the WOCE/NASA Altimeter algorithm Workshop, Appendix to U.S. WOCE Technical Report No.2*, edited by D. B. Chelton, U.S. WOCE Office, Texas A&M Univ, College Station, Texas.

11. Fu, L.-L., and M. Lefebvre, 1989: TOPEX/POSEIDON : Precise measurement of sea level from space, in *CSTG Bulletin No.11: New Satellite Missions for Solid Earth Studies - Status and Preparations*, C. Reigber (editor), pp. 51-54, Deutsches Geodatisches Forschungsinstitut (DGFI), Abt.I, Marstallplatz 8, D-8000 Munchen 22, FRG.

12. Zlotnicki, V., A. Hayashi, and L.-L. Fu, 1990: *The JPL-Oceans-8902 Version of Geosat Altimetry Data*, JPL Internal Document D-6939, Jet propulsion Lab., Pasadena, CA, 17pp.

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14. Fu, L.-L., (editor), 1993: *TOPEX/Poseidon Verification Workshop- A Summary Report,* JPL internal document, JPL D-10815, Jet Propulsion Laboratory, Pasadena, Calif., 24 pp.

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18. Halpern, D., L. Fu, W. Knauss, G. Pihos, O. Brown, M. Freilich, F. Wentz, 1995: *An Atlas of Monthly Mean Distributions of SSMI Surface Wind Speed, AVHRR/2 Sea Surface Temperature, AMI Surface wind velocity, TOPEX/POSEIDON SEa surface Height, and ECMWF Surface Wind Velocity During 1993*. JPL publication 95-3, Jet Propulsion Laboratory, Pasadena, CA, 88 pp.

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25. Fu, L.-L., and Y. Menard, 2004: Advances in large-scale ocean dynamics from a dacade of satellite altimetric measurement of ocean surface topography, in *Satellite Altimetry for Geodesy, Geophysics and Oceanography,* edited by C. Hwang, C. Shum, and J. Li, pp.33-38, Springer-Verlag, Berlin, Germany.

26. Fu, L-L., and E. Rodriguez, 2004: Observing the ocean with a wide swath altimeter, AVISO Newsletter, No. 10, 15-17, CLS, 8-10 rue Hermes, Parc Technologique du Canal, F-31526 Ramonville, St. Agne, France