Curriculum Vitae-abridged

W. TIMOTHY LIU

EDUCATION

University of Washington, Seattle, Washington
PH. D. in Atmospheric Sciences, March 1978
M.S. in Atmospheric Sciences, June 1974
Ohio University, Athens, Ohio
B.S., Summa Cum Laude, in Physics, June 1971

EMPLOYMENT

1979-present Jet Propulsion Laboratory

Principal investigator since 1979. Study ocean-atmosphere interaction and satellite oceanography.

Team Leader of Air-sea Interaction and Climate Team 1989-2005. Supervise a team of meteorologists and oceanographers, and lead their science investigations.

Project Scientist of *a series of* NASA Scatterometer Missions-NSCAT, QuikSCAT and SeaWinds, 1992-2006. Coordinate and monitor science and validation studies of the science team. Monitor sensor and data system development to meet science requirements.

NASA Ocean Vector Wind Science Team Leader. 2006-2008. Lead the investigators of the NASA selected team

Senior Research Scientist since 1993. The position is equivalent to a full professor at major universities**.**

1971-1979 University of Washington.

Research Associate, 1978-1979. Modeling planetary boundary layer and study turbulence flux measurements from aircraft.

Research Assistant, 1971-1978. Studying the transfer processes across the air-sea interface and in the atmospheric boundary layer leading to M.S. and Ph.D. degrees.

Teaching Assistant Assisting teaching of an introductory course in meteorology and a field experiment course in air-sea transfer processes.

HONORS AND AWARDS

Verner E. Suomi Award, American Meteorological Society
Fellow of American Geophysical Union
Fellow of American Association for the Advancement of Science
Fellow of American Meteorological Society
Senior Member of IEEE (top 8% of membership)
Distinguish Visiting Professor, U.S. Naval Postgraduate School
Space Systems Award, American Institute of Aeronautics and Astronautics
Distinguished Science Award, Pan Oceanic Remote Sensing Assoc.
Science Advisor, Hong Kong Observatory
Honorary Professorship at China Ocean University

NASA Exceptional Service Medal, 2012, Pionnering spaceborne instrumentation for air-sea fluxes
NASA Medal for Exceptional Scientific Achievement, 1990-Air-sea Interaction
NASA Exceptional Achievement Medal, 1998 - Leadership in NSCAT Sci.Research
NASA Group Achievement Award 2001-Satellite Ocean Atlas.
NASA Group Achievement Award, 2000 – Quikscat Mission Team
NASA Group Achievement Award, 1998 - NSCAT Science Team
NASA Group Achievement Award 1997 - NSCAT Management and Outreach
NASA Group Achievement Award 1994 - Topex Verification
NASA Group Achievement Award 1993 - Topex Mission Design
NASA Certificates of Recognition 1993 - Hydrologic Balance and Greenhouse Warming
NASA Certificates of Recognition 1991 - Remote Sensing of Turbulent Flux
NATO Fellowship to Advanced Study Institute on Air-Sea Interaction, 1978.
Sigma Xi 1975
Phi Beta Kappa 1971
Ohio University Trustee Scholarship 1967-1971
Ohio University Dean's List 1969-1970
Sigma Pi Sigma 1970

PROFESSIONAL SERVICES

Group for High Resolution Sea Surface Temperature Science Team 2011-present
AMS Ocean Research Award Committee 2010-2013
ISPRS Commission VII, Chairman of Work Group on Ocean 2008-2013
JAXA GCOM-W Science Team 2008-present
ISRO Oceansat-2 Science Team 2008-2014
ESA-EUMETSA ASCAT Science Advisory Group 2006-2012
US Atlantic Meridional Overturning Current Science Team 2008-present
Pan-Oceanic Remote Sensing Conference Association, Executive Board, 2006 to present
United Kingdom Natural Environment Research Council-Earth Observation Centres of Excellence Steering Committee 2003-2008
NASA Global Water and Energy Research Initiative Working Group 2001
Tropical Rain Measuring Mission Science Working Team, 1998-present.
Salinity and Sea Ice Science Working Group, 1998-2002.
EOS Distributed Active Archive Center Users Working Group 1994-2004.
Interagency Science Working Group on Passive Microwave Vector Wind Sensing, 1995-1997.
South China Sea Monsoon Experiment Science Working Group 1994-1996.
Joint Science Committee Task Force on Air-Sea Fluxes, 1993-1997. Coordinate and promote international studies of air-sea fluxes.
Editorial Board, The Atmosphere-Ocean System, 1993-1998.
Environmental Task Force, 1992. Invited member of the Clouds, Radiation, Water Vapor, and Precipitation Panel. To compile for the intelligence community the data need of the environmental scientists.
NASA TOGA-COARE Science Advisory Committee, 1991-1994. Advise NASA on participation in the experiment.
NASA ESTAR (Electronically Scanned Thinned Array Radiometer) ***Science Working Group,*** 1990-1995.

Tropical Rain Measuring Mission Science Team 1991-1993

NASA Earth Science & Application Advisory Committee 1990-1993. Advise the NASA Division on program and policy.

WCRP Surface Radiation Budget Science Working Group, 1989-1996.-Plan and implement the production of surface radiative exchange.

Earth Observing System Investigator Working Group, 1989-2000. Formulate science requirements and lead science research for the project. Member of Payload, Oceanography, Hydrology and Climate Panels.

NASA TOPEX NSCAT Archiving Working Group, 1989**.** Advise NASA on archiving and distributing data for NSCAT and TOPEX Projects.

International WOCE Working Group on In Situ Measurement for Surface Fluxes, 1989-1990. Recommend the best method for measuring air-sea fluxes.

TOGA COARE Science Working Group, 1989-1992. Refine the objectives, to design the experimental approach, and to define an implementation methodology for the TOGA/COARE. Chairman of Air-Sea Fluxes Subgroup.

NASA Wetnet, 1988-1995. Design and implement an interactive science network centered on SSMI data.

Interagency Sea Surface Temperature Archiving Science Working Group, 1988-89**.** Assess the quality and availability of sea surface temperature data.

WOCE Advisory Group for Model-based Air-sea Flux Estimates, 1988-1995. Advise WOCE on air-sea fluxes estimates using numerical models.

TOPEX/POSEIDON Science Working Team 1987-1997. Formulate science requirements and to conduct research for the joint U.S/French ocean altimetric mission. Member of the Science Steering Group.

JSC/CCCO Working Group on Air-Sea Fluxes, 1987-93. Promote the optimal use of oceanographic satellite data for the determination of air-sea interface quantities. Appointed by the Joint Science Committee and the Committee on Climate Changes and the Ocean (CCCO).

NSCAT Science Working Team 1986-present. Conduct science research and to formulate requirements for the NASA Scatterometer Project (NSCAT). Chairman of the Subcommittee on Data Level and Contents.

WOCE/TOGA Working Group on Data Management 1985-1988. Develop a data management system for WOCE and TOGA.

WOCE Working Group on Atmosphere-ocean Exchanges, 1984-1988. Assess present capabilities of describing atmosphere-ocean exchanges of physical properties.

NASA Ocean Energy Fluxes Science Working Group 1984. Assess geophysical retrieval algorithms of DMSP/SSMI (Special Sensor Microwave Imager) and Geosat/altimeter and to review the scientific problems that can be addressed using their geophysical parameters.

Guest Lecturer: (1) NATO Advanced Study Institute at Corsica France, 1983. (2) California Space Institute Summer School on Climate Remote Sensing 1987, (3) University of Southern California-graduate course in tropical oceanography, 1990 and 1992. (4) NASA Summer School on Earth Sciences, 1992.

SUMMARY OF PROFESSIONAL ACCOMPLISHMENTS

W. Timothy Liu's experience and expertise are in ocean-atmosphere interaction and application of spacebased observations.

While a student at the University of Washington, Timothy Liu conducted both laboratory and field experiments to study interfacial transport and turbulent transfer in the surface (constant flux) layer over the ocean. His postulation of the behavior of the moisture transfer coefficients, at low and high winds were unconventional at that time, and led later to the validation effort in the Humidity Exchange Over Sea (HEXOS) experiment and Tropical Ocean Global Atmosphere (TOGA)-Couple Ocean and Response Experiment (COARE) in the eighties and nineties. Its impact is still felt more than three decades later. His formulation of temperature profile and transport theory in the molecular sub-layer, which is based on gas transfer studies, are being used by the communities studying gas transfer and ocean skin layer today.

Timothy Liu developed the first credible method of using satellite data to estimate evaporation and latent heat flux in the early 1980s, and was one of the first scientists to use a combination of satellite sensors to study the global relation between surface thermal forcing and ocean temperature response. In the past three decades, a generation of scientists have been involved in the estimation of heat flux from space, based on his methodology. With a new generation of microwave radiometers and atmospheric sounders, he is leading a renewed effort to retrieve evaporation directly from the radiance measured by spacebased microwave radiometer. He has also developed a method of estimating moisture transport integrated over the depth of the atmosphere using spacebased measurements through a statistical model. The divergence of the transport is the fresh water flux (evaporation-precipitation) at the ocean surface. The methodology contributes to water balance of over the global oceans and the influence of the ocean on terrestrial and cryospheric water balances. He demonstrated the unique capability of the scatterometer in measuring ocean surface stress as distinguished from wind measurements over ocean fronts and under strong hurricanes.

Since he joint JPL, Timothy Liu has been selected to the science teams of numerous space missions, including NSCAT, QuikSCAT, Topex/Poseidon, JASON, TRMM, EOS, Aqua, ERS-1, AMSR, Aquarius, GCOM-W, ISRO Oceansat-2, GPM and CYGNSS. He has made many science applications of various combinations of these spacebased measurements, in the characterization and understanding the changes of weather, climate, and environment. For 14 years, he was the Project Scientist of three spacebased scatterometer missions, securing funding for the international science team, leading the scientific research, and monitoring the performance of the instruments to meet scientific needs.

Through 17 years as Team Leader and 14 years as Project Scientist, Timothy Liu was able to lead various groups of scientists through many cycles of fiscal gyration and changes of national and institutional priorities, secure their funding support, communicate and promote their results to the science community and to the public,

PUBLICATIONS

W. Timothy Liu has 304 publications, of which 167 (marked by *) are refereed journal articles and reviewed book chapters.

2015 6(167)

*304 Sha, J. Y.-H. Jo; M. J Oliver; J. Kohut; M. Shatley, W. T Liu; X.H. Yan, 2015: A Case Study of Large Phytoplankton Blooms off the New Jersey Coast with Multi-Sensor Data. *Continental Shelf Res.*, In Press

*303 Li, F., Jo, Y., Yan, X-H., and W. T. Liu. 2015: Varying temperature and heat content signatures in the central Labrador Sea at different layers and timescales, *Deep-Sea Research*, 2015, DOI: 10.1016/j.dsr.2015.04.012.

*302 Wang, Y.-H. and W. T. Liu, 2015: Observational evidence of frontal-scale atmospheric response to Kuroshio Extension variability. J. Climate, in press

*301 M. Rodell, H.K. Beaudoing, T.S. L'Ecuyer, W.S. Olson, J.S. Famiglietti, P.R. Houser6 R. Adler, M.G. Bosilovich, C.A. Clayson, D. Chambers, E. Clark, E.J. Fetzer5, X. Gao, G. Gu, K. Hilburn, G.J. Huffman, D.P. Lettenmaier, W.T. Liu, F.R. Robertson, C.A. Schlosser, J. Sheffield, and E.F. Wood, 2015: The Observed State of the Water Cycle in the Early 21st Century. *J. Climate*, in press

300 Liu, W.T., W. Tang, and X. Xie, 2015: Measuring surface stress in tropical cyclones with scatterometer. Presented at Intergovernment Hurricane Conference in Jacksonville, March 2015. http://airsea.jpl.nasa.gov/publication/paper/Liu-IHC2015-Stress.pdf

299 Liu, W.T., and X. Xie, 2015: The classic problem of Indian Monsoon-what AMSR-2 can reveal. Presented at GCOM-W Principle Investigator Meeting, 1/14/2015, Tokyo http://airsea.jpl.nasa.gov/publication/paper/Liu-Xie-gcom2015.pdf

*298 Liu, W.T., 2015: Surface wind and stress. Encyclopedia of Atmospheric Science (Second Edition),Gerald R. North, John Pyle and Fuqing Zhang (ed.), Elsevier, 138-144.

*297 Li, F., Y.-H., Yan, X.-H., Liu, W. T., 2014. Climate signals in the mid to high latitude North Atlantic from altimeter observations. J. Climate, DOI: 10.1175/JCLI-D-12-00670.1.

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*296 Zeng, L., W.T. Liu, H. Xue, P. Xiu, and D. Wang, 2014: Freshening in the South China Sea during 2012 revealed by Aquarius and in-situ data. J. Geophys. Res., DOI: 10.1002/2014JC010108

295 Liu, W.T., and X. Xie, 2014: Ocean-atmosphere Coupling Over Mid-latitude Ocean Fronts Observed from Space. Key-note presentation. Proc. Eumetsat Conf., Geneva. 9pp. http://airsea.jpl.nasa.gov/publication/paper/Liu-Xie-Eumetsat.proc-2014.pdf

294 Liu, W.T. and X. Xie, 2014: Ocean surface carbon dioxide fugacity observed from space. JPL Publication 14-15, Jet Propoulsion Laboratory, Pasadena, 22pp.

*293 Liu, W.T., W. Tang, R. Pinker, X. Niu, 2014: Solar warming of south central Pacific. Int. J. Remote Sensing, DOI: 10.1080/01431161.2014.926426.

*292 Tang, W., W. T. Liu, B. Stiles and A. Fore, 2014, Detection of diurnal cycle of ocean surface wind from space-based observations, *International Journal of Remote Sensing*, DOI: 10.1080/01431161.2014.926413

*291 Liu, W.T., and X. Xie, 2014: Sea surface wind/stress vector.,Encyclopedia of

Remote Sensing. E. Njoku (ed.), Springer-Verlag Berlin Heidelberg, 759-767. DOI: 10.1007/SpringerReference_327232.

*290 Liu, W.T. and X. Xie, 2014: Ocean-atmosphere water flux and evaporation, Encyclopedia of Remote Sensing. E. Njoku (ed.), Springer-Verlag Berlin, Heidelberg, 480-489. DOI: 10.1007/SpringerReference_327186.

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289 Liu, W.T., 2013: Different sampling of high frequency ocean surface wind from space. Bull. of PORSEC, Vol 7-2, 4-6.

*288 Wu, X., X.-H. Yan, Y.-H. Jo, W.T. Liu, 2013: Estimation of subsurface temperature anomaly in the North Atlantic using a self-organizing map neural network. J. Atmos, Ocean. Tech., 29,1675-1688.

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*287 Li, F., Y.-H. Jo, W.T.Liu, and X.-H. Yan: A dipole pattern of sea surface height anomaly in the North Atlantic:1990-2000s, Geophys. Res. Lett., 39, L15604, doi10.1029.2012GL052556.

*286 Liu, W. T., X. Xie, and K. B. Katsaros, 2012: Observation of oceanic origin of Sahel precipitation from space, Remote Sensing of Environment, 123, 593-599.

*285 Liu, W.T. and X. Xie, 2012: Offshore strong wind for electric power generation. "Wind Energy Conversion System: Technology and Trend", Chapter 15, 367-383, S.M. Muyeen (ed.), Springer Verlag, London.

284 Tang, W. and W.T. Liu: Relating ocean surface wind and rain. Proceeding of AMS

2011 2 (152)

*283 Katsaros, K. B., A. Bentamy, M. Bourassa, N. Ebuchi, J. Gower, W. T. Liu, and S. Vignudelli, 2011: Climate Data Issues from an Oceanographic Remote Sensing Perspective, Remote Sensing of the Changing Oceans, Springer-Verlag, Berlin, Germany, 7 – 32 pp, ISBN: 978-3-642-16540-5.

*282 Dong, X., X. Baike, A. Kennedy, Z. Feng, J.K. Entin, P.R.Houser, R.A.Schjffer, T. L'Ecuyer, W.S. Olson, K. Hsu, W.T. Liu, B. Lin, Y. Deng, and T. Jiang, 2011: Investigation of the 2006 drought and 2007 flood extremes at the Southern Great Plains through an intergrative analysis of observations. J. Geophys. Res., 116, D03204, doi:10.1029/2010JD014776..

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281 Bourassa, M. A., A. Stoffelen, P. Chang, D. Chelton, R. Edson, Z. Jelenak, T. Lee, W. T. Liu, D. Long, M. Powell, E. Rodriguez, D. Smith, and F. Wentz, 2010: Remotely sensed winds and wind stresses for marine forecasting and ocean modeling. Proceedings of the Integrated Ocean Observing System (IOOS) Summit Workshop.

*280 Bourassa, M. A., H. Bonekamp, P. Chang, D. Chelton, J. Courtney, R. Edson, J. Figa, Y. He, H.Hersbach, K. Hilburn, T. Lee, W. T. Liu, D. Long, K. Kelly, R. Knabb, E. Lindstorm, W.Perrie, M. Portabella, M. Powell, E. Rodriguez, D. Smith, A. Stoffelen, V. Swail, and F.Wentz, 2010: Remotely sensed winds and wind stresses for marine forecasting and ocean modeling. Proceedings of the OceanObs'09: Sustained Ocean Observations and Information for Society Conference (Vol. 2), Venice, Italy, eds. J. Hall, D.E. Harrison and D. Stammer, ESA Publication WPP-306. doi:10.5270/ OceanObs09.cwp.08

*279 Lee, T., W.R. Hobbs, J.K. Willis, D. Halkides, I. Fukumori, E.M. Armstrong, A.K. Hayashi, W.T. Liu, W. Patzert, O. Wang. Record warming in the South Pacific and western Antarctica associated with the strong central Pacific El Nino in 2009-10. *Geophys. Res. Lett.*, **35**, L13808, doi:10.1029/2008GL034172.

*278 Ho, S.-S, W. Tang, W.T. Liu, and M. Schneider, 2010: A framework of moving sensor data query and retrieval of dynamic atmospheric events. SSWDBM.

*277 Liu, W.T., X. Xie, and W. Tang, 2010: Scatterometer's unique capability in measuring ocean surface stress. Oceanography from Space, Barale, Gower, and Alberotanza (eds), Chapter 6, Springer, 93-111.

*276 Liu, W.T., W. Tang, and X. Xie, 2010: Wind power at sea as observed from space. Wind Power, Chapter 14, 341-352, S.M. Muyeen (ed.) Intech, Vukovar.

2009 3(145)

*275Waliser, D. E., B. Tian, X. Xie, W. T. Liu, M. J. Schwartz, and E. J. Fetzer (2009), How well can satellite data characterize the water cycle of the Madden-Julian Oscillation?, Geophys. Res. Lett., 36, Waliser L21803, doi:10.1029/2009GL040005.

*274 Zeng, L., P. Shi, W. T. Liu, and D. Wang, 2009: Evaluation of a satellite-derived latent heat flux product in the South China Sea: A comparison with moored buoy data and various products. Atmos. Res., 94, 91-105.

*273 Lin, I-I, C.-H. Chen, I.-F. Pun, W.T. Liu, and C.-C. Wu, 2009: Warm ocean anomaly, air sea fluxes and the rapid intensification of tropical cyclone Nargis (2008). *Geophys. Res. Lett*., 36, L03817, doi:10.1029/2008GL035815.

2008 8(142)

272 Liu, W.T., 2008: Mapping wind energy over oceans. SPIE Newsroom. SPIE, Bellingham, WA..

*271 Wang, H., R. Fu, J.K. Schemm, W. Tang, and W.T. Liu, 2006: Prediction of South American low-level jet using QuikSCAT ocean surface wind. *Int. J. Remote Sens*., **29**(21), 6117-6172.

*270 Liu, W.T., W. Tang, X. Xie, R.Navalgund , and K.Xu, 2008: Power density of ocean surface wind-stress from International scatterometer tandem missions. *Int. J. Remote Sens.*, 29(21),6109-6116.

*269 Lee,T., O. Wang, W. Tang, and W. T. Liu: Wind stress measurements from the QuikSCAT-SeaWinds scatterometer tandem mission and the impact on an ocean model. J. Geophys. Res., 113, C12019, doi:10.1029/2008JCX004855.

268 Liu,W.T., W.Tang, and X. Xie, 2008: Measuring strong winds and their distribution over global ocean. *Proc. of IGARSS 2008*, IEEE

*267 Liu,W.T., W. Tang, X. Xie, 2008: Windpower distribution over global ocean. *Geophys. Res. Lett.*, **35**, L13808, DOI:10.1029/2008GL034172.

*266 Liu, W.T. and X. Xie, 2008: Ocean-atmosphere momentum coupling in the Kuroshio Extension observed from space. *J. Oceanogr*., **64** (4), 631-637.

265 Liu, W,T,, W. Tang, and X. Xie, 2008: Energy and water cycles observed by Advanced Scanning Microwave Radiometer. *Report to Japan Aerospace Exploration agency*.

*264 Han, W., P.J. Webster, J.-L. Lin, W.T. Liu, R. Fu, D. Yuan, A. Hu, 2008: Dynamics of intraseasonal sea level and thermocline variability in the equatorial Atlantic during 2002-2003, *J. Phys. Oceanogr*., **38**, 945-967.

*263 Yan, X., Y. Jo, L. Jiang, Z. Wan, W. T. Liu, Y. Li, J. Zhan, and T. Du (2008), Impact of the Three Gorges Dam water storage on the Yangtze River outflow into the East China Sea, *Geophys. Res. Lett*., **35**, L05610, doi:10.1029/2007GL032908.

262 Liu, W.T. and X. Xie, 2008: Latent heat flux and ocean-atmosphere water exchanges. *Flux News*, Vol. **5**, 19-21, CLIVAR International Project Office, Southhampton, United Kingdom.

*261 Xie,X.,W.T. Liu and B. Tang 2008: Spacebased estimation of moisture transport in marine atmosphere using support vector machine, *Remote Sens. Environ.*, **112**, 1845-1855.

2007 5(134)

*260 Pu, Z., X. Li, C. Velden, S. Aberson, W. T. Liu, 2007: The impact of aircraft dropsonde and satellite wind data on numerical simulations of two landfalling tropical storms during tropical cloud systems and processes experiment. *Wea. Forecasting*, **23**,62-79.

*259 Liu, W.T., X. Xie, and P.P. Niiler, 2007: Ocean-atmosphere interaction over Aqulhas Extension Meanders. J. Climate, 20(23), 5784-5797 .

258 Liu, W.T., and X. Xie, 2007: QuikSCAT shows rough seas/atmospheric conditions at time of two Java Sea disasters. The Earth Observer, 19(3), 4.

257 Liu, W.T., and X. Xie, 2007: Ocean-atmosphere coupling in the western Pacific and Asian marginal seas observed from space. Pacific Asian Marginal Sea. 46-49, Arata Kaneko (ed), Hiroshima Univ. Press.

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*255 Liu, W. T., and X. Xie, 2007: Winds over ocean. *Glimpses of a Changing World: Views of Planet Earth from Space*, M. D. King, C. L. Parkinson, K. C. Partington, and R. G. Williams, Eds., Cambridge University Press, 140-143.

*254 Han, W., D. Yuan, W. T. Liu, and D. J. Halkides, 2007: Intraseasonal variability of Indian Ocean sea surface temperature during boreal winter:Madden-Julian Oscillation versus submonthly forcing and processes, J..Geophys. Res., 112, C04001, doi:10.1029/2006JC003791

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253 Liu, W.T, and X. Xie, 2006: International scatterometer tandem missions and potential synergism. Pan Oceanic Remote Sensing Conference, Korean Society of Remote Sensing Press, Seoul.

*252 Xie, S.-P., H. Xu, N.H. Saji, Y. Wang, and W.T. Liu, 2006: Role of narrow mountains in large-scale organization of Asian monsoon convection. *J. Climate,* **19**, 3420-3429.

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*247 Liu, W.T., and X. Xie 2006: Measuring ocean surface wind from space. Remote Sensing of the Marine Environment, Manual of Remote Sensing, Third Edition, Vol. 6, , J. Gower (ed,), Amer. Soc. for Photogrammetry and Remote Sens. Chapter 5, 149-178.

*246 Yan, X.-H., Y.-H. Jo, W.T. Liu, and M.-X. He, 2006: A new study of the Mediterranean outflow, air-sea interactions and Meddies using multi-sensor data. J. Phys. Oceanogr., 36(4), 691–710..

2005 5(123)

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244 Liu, W.T., X. Xie, and W. Tang, 2005: Monsoon, orography, and human influence on Asian rainfall. Proc. First International Symposium on Cloud-prone and Rainy Areas Remote Sensing. Hong Kong Chinese University Press. http://airsea.jpl.nasa.gov/publication/paper/CARRS-ms5.pdf

*243 Sprintall, J. and W.T. Liu, 2005: Ekman mass and heat transport in the Indonesian Seas. Oceanography, 18(4), 88-97,

*242 Evans, D., W. Alpers, A. Cazenave, C. Elachi,T. Farr, D. Glackin, B. Holt, L.Jones, W.T. Liu, W. McCandless, Y. Menard, R. Moore, and E. Njoku, 2005: Seasat – a 25-year legacy of success. Remote Sens. Envir, 94, 384-404.

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*236 Jo, Y.-H., X.-H. Yan, B. Dzwonkowski, and W.T. Liu, A study of freshwater discharge from the Amazon River into the tropical Atlantic using multi-sensor data. *Geophys. Res. Lett*., 32. :02605, doi:10.1029/2004GL021840.

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