

CURRICULUM VITAE

ŽELJKA FUCHS

Climate and Water Center, NMT, USA

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EDUCATION

- * Doctor of Philosophy in Physics with Dissertation in Atmospheric Physics, Physics Department and Geophysical Research Center, New Mexico Institute of Mining and Technology, December, 2005, Dissertation Title: Large-Scale Modes of the Tropical Atmosphere, Advisor: Dr. David J. Raymond
- * Master of Science in Physics, Physics Department and Geophysical Research Center, New Mexico Institute of Mining and Technology, April, 2001, Thesis Title: Linear Modes of Raymond's Model of a Moist Atmosphere, Advisor: Dr. David J. Raymond
- * Bachelor of Science in Physics, Department of Geophysics, Faculty of Science, University of Zagreb, Croatia, November, 1998, Thesis Title: Mountain Lee Waves, Advisor: MS Katarina Stankovic

PROFESSIONAL EXPERIENCE

- * May 2017 - : Climate and Water Center director, NMT, USA
- * August 2016 – May 2017: Visiting Faculty, NMT, USA
- * May 2015 – August 2016: Researcher, NMT, USA
- * July 2014 – May 2015: Visiting professor/researcher, NMT, USA
- * December 2007 – June 2014: Assistant Professor, Faculty of Science in Split, Croatia
- * 2011 – 2012: Visiting professor, NMT, USA
- * 2008 - 2009: Vice-president for Science, Faculty of Science in Split, Croatia
- * May 2007 - : Faculty Adjunct, New Mexico Institute of Mining and Technology, USA
- * May 2007 - December 2007: The National Science Foundation Postdoc in Croatia
- * August 2006 - May 2007: Visiting assistant professor, New Mexico Institute of Mining and Technology, USA
- * January 2006 - August 2006: Postdoctoral research associate, New Mexico Institute of Mining and Technology, USA
- * Spring 2006: Lecturer of General physics I, New Mexico Institute of Mining and Technology, USA
- * Fall 2005: Lecturer of General physics II, New Mexico Institute of Mining and Technology, USA
- * February 2004 - August 2005: Visiting lecturer at the Department of Geophysics, Faculty of Science, University of Zagreb
- * May 2000 - November 2005: Graduate research assistant, New Mexico Institute of Mining and Technology, USA
- * July 1999 - May 2000: Graduate teaching assistant, New Mexico Institute of Mining and Technology, USA

BOOKS

- * Fuchs, Z: Physics of the Tropical Atmosphere, VDM. 2009. ISBN: 978-3-639-21572-4.
- * Fuchs, Z: Concepts of Parameterization for Atmospheric Convection; Volume 1: Theoretical Background and Current Issues, Chapter 5: Tropical dynamics - Large-scale convectively-coupled waves, in press

REFERRED PUBLICATIONS

1. Fuchs, Ž. and D. J. Raymond (2017), A simple model of intraseasonal oscillations, *J. Adv. Model. Earth Syst.*, 9, doi:10.1002/2017MS000963. (Research spotlight)
2. Herman, M. J., Z. Fuchs, D. J. Raymond, P. Bechtold, 2016: Convectively coupled Kelvin waves: From linear theory to global models. *J. Atmos. Sci.*, 73, 407-428.
3. Raymond, D. J., Z. Fuchs, S. Gjorgjievska, S. L. Sessions, 2015: Balanced dynamics and convection in the tropical troposphere, *J. Adv. Model. Earth Syst.*, 07, doi:10.1002/2015MS000467.
4. Stipo Sentic, Sharon Sessions, Zeljka Fuchs: Diagnosing Convection with Weak Temperature Gradient Simulations of DYNAMO. 2015. *Journal of Advances in Modeling Earth Systems*. doi:10.1002/2015MS000531
5. Yano, J.; Geleyn, J.-F.; Köhler, M.; Mironov, D.; Quaas, J.; Soares, P.M.M.; Phillips, V.T.J.; Plant, R.S.; Deluca, A.; Marquet, P.; Stulic, L.; **Fuchs, Z.** Basic Concepts for Convection Parameterization in Weather Forecast and Climate Models: COST Action ES0905 Final Report. *Atmosphere* **2015**, 6, 88-147.
6. **Fuchs, Z.**, S. Sessions, and D. J. Raymond, 2014: Simulating Convectively Coupled Kelvin Waves from CRM: Thermodynamics, Dynamics, and Model Parameters, *Tellus A*, 66, 22107, <http://dx.doi.org/10.3402/tellusa.v66.22107>.
7. **Fuchs, Z.**, Herman M. and Raymond D. J., 2014: [Frictional convergence in a weak decaying vortex](#). *Journal of the Atmospheric Sciences*. 71, 2467-2475.
8. Raymond, D. J., S. Gjorgjievska, S. Sessions, and Z. **Fuchs**, 2013: [Tropical cyclogenesis and mid-level vorticity](#). *Australian Meteorological and Oceanographic Journal*, 64, 11-25.
9. **Fuchs, Z.**, S. Gjorgjievska, and D. J. Raymond, 2012: Effects of varying the shape of the convective heating profile on convectively coupled gravity waves and moisture modes. *Journal of the Atmospheric Sciences*. August 2012, Vol. 69, No. 8 : pp. 2505-2519. doi: 10.1175/JAS-D-11-0308.
10. Fuchs, Z., and B. Valcic, 2012: Fishers' perspectives on weather forecasting in the Croatian Adriatic. *Acta Adriatica*. In review.
11. Comellas, A., **Fuchs Z.**, Molini L., and A. Parodi, 2012: [Saturation fraction and gross moist stability in severe precipitating systems in the midlatitude Mediterranean environment](#). *Atmospheric Research*, 123, 360-367. doi: 10.1016/j.atmosres.2012.07.010.
12. Yano, J. I. M. Bister, Z. **Fuchs**, L. Gerard, V. Phillips, S. Barkidija, and J. M. Pirious, 2012: Phenomenology of convection-parameterization closure. *Atmospheric Chemistry and Physics*. 12, 25743–25789.
13. Barkidija, and Z. **Fuchs**, 2012: [Precipitation Correlation Between Convective Available Potential Energy, Convective Inhibition and Saturation Fraction in Middle Latitudes](#). *Atmospheric Research*, 124, 170–180.
14. Dokleštic, D., Z. **Fuchs** and A. Marki, 2010: Convectively coupled Kelvin waves and convective inhibition. *Geophysics*, 77, 21-36.
15. Raymond, D. J., S. Sessions, A. H. Sobel, Z. **Fuchs**, 2009: [The Mechanics of Gross Moist Stability](#). *J. Adv. Model Earth Syst.*, Vol. 1, 20 pp.
16. Raymond, D. J., and Z. **Fuchs**, 2009: [Moisture modes and the Madden-Julian oscillation](#). *J. Climate*, 22, 3031-3046.

17. Raymond, D. J., and Z. **Fuchs**, 2007: [Convectively coupled gravity and moisture modes in a simple atmospheric model](#). Tellus, 59A, 627-640.
18. **Fuchs**, Z., and D. J. Raymond, 2007: [A simple, vertically resolved model of tropical disturbances with a humidity closure](#). Tellus. 59A, 344-354.
19. Raymond, D. J., S. Sessions, and Z. **Fuchs**, 2007: [A theory for the spinup of tropical depressions](#). Quarterly Journal of the Royal Meteorological Society. 133, 1743-1754.
20. **Fuchs**, Z., and A. Marki, 2007: Large-scale modes of the tropical atmosphere. Part II: analytical modelling of Kelvin waves using the CAPE closure. Geophysics. 24. 43-55.
21. **Fuchs**, Z., 2007: Analytical model of equatorial waves with CAPE and moisture closure. Geophysics. 24. 29-42.
22. **Fuchs**, Z., and A. Marki, 2006: Large-Scale Modes of the Tropical Atmosphere. Part I: Analytical Modeling of Convectively Coupled Kelvin Waves Using the Boundary-Layer Quasiequilibrium Approximation. Geophysics. 23. 155-164.
23. **Fuchs**, Z., D. J. Raymond, 2005: [Large-Scale Modes in a Rotating Atmosphere with Radiative-Convective Instability and WISHE](#). Journal of the Atmospheric Sciences. 62, 4084-4094.
24. Raymond, D. J., G. Raga, C. Bretherton, J. Molinari, C. Lopez-Carrillo, Z. **Fuchs**, 2003: [Convective Forcing in the Intertropical Convergence Zone of the Eastern Pacific](#). Journal of the Atmospheric Sciences, 60, 2064-2082
25. **Fuchs**, Z., D. J. Raymond, 2002: [Large-Scale Modes of a Nonrotating Atmosphere with Water Vapor and Cloud-Radiation Feedbacks](#). Journal of the Atmospheric Sciences. 59, 1669-1679.

CONFERENCES

1. Ž. Fuchs and D. J. Raymond, 2018: Planetary disturbances: the influence of mean easterlies and moisture in simple models, AMS, Austin, TX
2. Ž. Fuchs and D. J. Raymond, 2016: Madden-Julian Oscillation and WISHE-Moisture Mode. AGU Fall Meeting, San Francisco
3. Ž. Fuchs, M. J. Herman, D. J. Raymond, and P. Bechtold, 2016: Convectively Coupled Kelvin Waves: From Linear Theory to Global Models. 32nd Conference on Hurricanes and Tropical Meteorology
4. Sharon Sessions, S. Sentic, Z. Fuchs, and D. Raymond, 2016: Balanced Dynamics in the Madden-Julian Oscillation. 32nd Conference on Hurricanes and Tropical Meteorology
5. M. J. Herman, D. J. Raymond, and Ž. Fuchs, 2016: How the Occurrence of a Low-Level Moisture Anomaly Drives MJO Precipitation. 32nd Conference on Hurricanes and Tropical Meteorology
6. Slavko Radilovic, Darko Koracin, Zeljka Fuchs, 2015: Comparing the results from RegCM4 with measurements for surface temperature in the Adriatic, EMBRACE, Dubrovnik.
7. Peter Bechtold, Alessio Bozzo, Michael Herman, Željka Fuchs, Cathryn Birch (2015): Aerosols, diurnal convection cycle and tropical waves. CMIP, Dubrovnik.
8. Herman, M. J., Ž. Fuchs, D. J. Raymond, and P. Bechtold: The Role of Convective Inhibition in Convectively Coupled Kelvin Waves. Poster shown at the 20th Conference on Atmospheric and Oceanic Fluid Dynamics, Minneapolis, MN, USA, June 18, 2015.
9. Stipo Sentic, Sharon L. Sessions, Zeljka Fuchs (2014), Weak temperature gradient simulations; sensitivity to the thermodynamic environment. 31th Conference on Hurricanes and Tropical Meteorology, 31 March - 4 April, San Diego, California.
10. Herman, M. J., and Ž. Fuchs: Kelvin wave analysis of ECMWF models. Invited talk, European Center for Medium-Range Weather Forecasts (ECMWF), Reading, UK, January 21, 2014.
11. Stipo Sentic, Sharon L. Sessions, Zeljka Fuchs (2014), Weak temperature gradient simulations of MJO convection. Workshop on Tropical Dynamics and the MJO, 14 - 16 January, Honolulu, Hawaii.
12. Fuchs, Z., M. J. Herman and P. Bechtold, 2014: Convection and wave interactions, 3rd General Assembly. Utrecht, Netherlands.

13. Fuchs, Z, 2013 [Large scale disturbances and convection. COST Atmospheric Convection and its Parametrization, Postira, RH](#)
14. Fuchs, Z., D., J. Raymond and M. J. Herman: Interaction of Convection and Frictional Convergence. 30th Conference on Hurricanes and Tropical Meteorology. April 2012, Ponte Vedra, FL, USA.
15. Fuchs, Z., D., J. Raymond and S. Gjorgjievska: Convectively coupled gravity waves and moisture modes with top and bottom heavy vertical heating profiles. 29th Conference on Hurricanes and Tropical Meteorology. April 2011, Tuscon, AZ, USA.
16. Fuchs, Z: Tropical disturbances, different closures and vertical structure. March, 2011, Cambridge, Great Britain. *Invited talk.*
17. Fuchs, Z: Convectively coupled Kelvin waves. October, 2010, CIMA, Savona, Italy. *Invited talk.*
18. Fuchs, Z., D. J. Raymond and S. Sessions, 2009: Convectively Coupled Gravity Waves and Moisture Modes. Harvard Center for the Environment and the Harvard Oceanography Committee. 16-17 October, Cambridge MA, USA. *Invited talk.*
19. Fuchs, Z., S. Sessions, and D. J. Raymond, 2009: Comparison of the Analytical and Numerical Model for Convectively Coupled Gravity Waves. 17th Conference on Atmospheric and Oceanic Fluid Dynamics. 8-12 June 2009, Stowe, VT, USA.
20. Fuchs, Z. and D. J. Raymond, 2007: Convective Inhibition and Dynamics in Convectively Coupled Kelvin Waves. IUGG. 2-13 July, 2007. Perugia, Italy.
21. Fuchs, Z., D. J. Raymond, 2006: A simple, vertically resolved model of tropical disturbances with a humidity closure. In 27th Conference on Hurricanes and Tropical Meteorology. 24-28 April 2006, Monterey, CA, USA
22. Fuchs, Z., D. J. Raymond, 2004: Extreme Simplification of Tropical Atmospheric Dynamics - Normal Modes. In 2004 Western Pacific Geophysics Meeting. 16-20 August, Honolulu, Hawaii, USA.
23. Comellas, A, A. Parodi, Z. Fuchs, and L. Molini: Saturation fraction and gross moist stability in severely precipitating systems in the midlatitude Mediterranean environment. Geophysical Research Abstracts Vol. 14, EGU2012-8776, 2012. EGU General Assembly 2012.
24. Parodi, A.; Comellas, A.; Molini, L.; Fuchs, Z.: Saturation fraction and gross moist stability in an evolving Mediterranean environment. American Geophysical Union, Fall Meeting 2011, A23D-0208
25. Saska Gjorgjievska, Z. Fuchs and D. J. Raymond: Convectively coupled Kelvin waves and moisture modes in 3-D simulations. 29th Conference on Hurricanes and Tropical Meteorology. April 2011, Tuscon, AZ, USA.
26. Raymond, D. J., S. Sessions, and Z. Fuchs, 2009: Control of convective precipitation over warm tropical oceans. 17th Conference on Atmospheric and Oceanic Fluid Dynamics. 8-12 June 2009, Stowe, VT, USA.
27. Sessions, S., D. J. Raymond and Z. Fuchs, 2008: Simulating large scale tropical waves. 28th Conference on Hurricanes and Tropical Meteorology. April-2 May 2008, Orlando, FL, USA.
28. Raymond. D. J., J. Cisneros, S. Sessions, J. C. Marin, G. Raga, and Z. Fuchs, 2008: Environmental influences on the spinup of tropical cyclones. 28th Conference on Hurricanes and Tropical Meteorology. April-2 May 2008, Orlando, FL, USA.
29. Raymond, D. J., S. Sessions, and Z. Fuchs, 2007: Theory for the spinup of tropical depressions. 17th Conference on Atmospheric and Oceanic Fluid Dynamics. 25-29 June 2007, Santa Fe, New Mexico, USA.
30. Lopez-Carillo, C., D. J. Raymond, Z. Fuchs, 2002: Development of New Convective Cells in the East Pacific Warm Pool. In 25th Conference on Hurricanes and Tropical Meteorology. 525-526. 29 April - 3 May, 2002, San Diego, CA, USA.

PROJECTS

- * Project coordinator and manager for field project Organization of Tropical East Pacific Convection OTREC 2019
- * Climate and Water Center, 2018 (cwc.nmt.edu)
- * Co-PI on NSF OTREC 2018 - 2020
- * Co-PI on NASA CPEX 2017 - 2019
- * Co-PI on NSF project: Balanced flows and tropical convection, 2016 - 2019
- * Partner on WindRisk, 2015-2016
- * EU FP7 [EMBRACE](#) 2011-2015
- * Collaborator on National Science Foundation (NSF) Project USA, 2014 – 2018
- * Collaborator on National Science Foundation (NSF) Project: A Rational Approach to Cumulus Parameterization in Large-Scale Models, USA, 2010 –2014
- * Management Committee Member of EU COST ES0905 of the Action “Basic Concepts for Convection Parameterization in Weather Forecast and Climate Models 2010-2014 Convection Action
- * Project leader on National Foundation for Science, Croatia (NZZ) Project, 2010 Second Split Workshop in Atmospheric Physics and Oceanography SWAP
- * Project leader on Science Festival for Split, April 19-25, 2010 Science Festival 2010
- * Project leader on National Foundation for Science, Croatia (NZZ) Project, 2009 First Split Workshop in Atmospheric Physics and Oceanography SWAP
- * Project leader on Unity through Knowledge Fund (UKF) Gaining Experience Grant (2A), 2009 International Atmospheric Research over the Adriatic
- * Collaborator on BASIC OROGRAPHIC ATMOSPHERIC CIRCULATIONS (BORA), 2007
- * Collaborator on NZZ Hybrid experimental GPU-CPU, 2008 –
- * Collaborator on National Science Foundation (NSF) Project, USA, 2000 – 2006

FIELD PROJECTS

- * OTREC 2019
- * NASA CPEX 2017
- * EPIC2001 project (East Pacific Investigation of Climate), Huatulco, Mexico, 2001.
- * EPIC 2001 Workshop. Seattle, 2002.

SERVICE AND PROFESSIONAL ACTIVITIES

- Coordinator and Manager for the field project Organization of Tropical East Pacific Convection (OTREC) 2019
- Founder of Climate and Water Center, 2018
- Program chair and organizer for AMS Named symposium for Dave J. Raymond, 2018
- Member of the prime-minister team working on the vision of Republic of Croatia 2030
- Distinguished national award for promotion of science, Republic of Croatia, 2012
- Founder and Head of Environment Masters Physics program, Split, Croatia, 2006-2016
- Organizer for conference: CMIP5 Model Analysis and scientific plans for CMIP6, Dubrovnik, Croatia, 2015
- National Committee member for Science Festival for Croatia, 2010 -
- Management Committee Member of EU COST ES0905 of the Action “Basic Concepts for Convection Parameterization in Weather Forecast and Climate Models 2010-2014 Convection Action

- Special award Slobodna Dalmacija for promotion of science, 2011
- Vice-president for Science, Faculty of Science in Split, Croatia, 2008-2009
- Member of Academy for Political Development, Croatia
- Organizer: Third Split Workshop in Atmospheric Physics and Oceanography SWAP
- Organizer: Second Split Workshop in Atmospheric Physics and Oceanography SWAP
- Organizer: First Split Workshop in Atmospheric Physics and Oceanography SWAP
- Reviewer: Journal of the Atmospheric Sciences, Journal of Climate, JAMES
- Member: American Meteorological Society
- Member: European Meteorological Society