

# CURRICULUM VITAE

## ŽELJKA FUCHS

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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

- \* August 2016 – 2017: Visiting Faculty, NMT, USA
- \* May 2015 – August 2016: Researcher, NMT, USA
- \* July 2014 – May 2015: Visiting professor/researcher, NMT, USA
- \* June 2014 – 2016: Associate Professor, Faculty of Science in Split, Croatia
- \* 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

## REFEREED PUBLICATIONS

1. 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.
2. 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](#). [EOS.org Research Spotlight](#). [JAMES Highlights](#)
3. Michael J. Herman; Zeljka **Fuchs**; David J. Raymond; Peter Bechtold, 2015: Convectively Coupled Kelvin Waves: From linear theory to global models. Journal of the Atmospheric Sciences. DOI: <http://dx.doi.org/10.1175/JAS-D-15-0153.1>
4. 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. (*The editors of Journal of Advances in Modeling Earth Systems have selected a paper "Balanced dynamics and convection in the tropical troposphere" (MS# 2015MS000467) to be featured as a Research Spotlight on <https://Eos.org> and on the journal's website.*)
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**, 2014: [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. 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.
11. 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.
12. Barkidija S, and Z. **Fuchs**, 2012: [Precipitation Correlation Between Convective Available Potential Energy, Convective Inhibition and Saturation Fraction in Middle Latitudes](#). *Atmospheric Research*, 124, 170–180.
13. Dokleštic, D., Z. **Fuchs** and A. Marki, 2010: Convectively coupled Kelvin waves and convective inhibition. *Geophysics*, 27, 21-36.
14. 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.
15. Raymond, D. J., and Z. **Fuchs**, 2009: [Moisture modes and the Madden-Julian oscillation](#). *J. Climate*, 22, 3031-3046.
16. Raymond, D. J., and Z. **Fuchs**, 2007: [Convectively coupled gravity and moisture modes in a simple atmospheric model](#). *Tellus*, 59A, 627-640.
17. **Fuchs**, Z., and D. J. Raymond, 2007: [A simple, vertically resolved model of tropical disturbances with a humidity closure](#). *Tellus*. 59A, 344-354.
18. 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.
19. **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.
20. **Fuchs**, Z., 2007: Analytical model of equatorial waves with CAPE and moisture closure. *Geophysics*. 24. 29-42.
21. **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.
22. **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.
23. 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
24. **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, 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
2. Sharon Sessions, S. Sentic, Z. Fuchs, and D. Raymond, 2016: Balanced Dynamics in the Madden-Julian Oscillation. 32nd Conference on Hurricanes and Tropical Meteorology

3. 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
4. Slavko Radilovic, Darko Koracin, Zeljka Fuchs, 2015: Comparing the results from RegCM4 with measurements for surface temperature in the Adriatic, EMBRACE, Dubrovnik.
5. Peter Bechtold, Alessio Bozzo, Michael Herman, Željka Fuchs, Cathryn Birch (2015): Aerosols, diurnal convection cycle and tropical waves. CMIP, Dubrovnik.
6. 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.
7. 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.
8. 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.
9. 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.
10. Fuchs, Z., M. J. Herman and P. Bechtold, 2014: Convection and wave interactions, 3<sup>rd</sup> General Assembly. Utrecht, Netherlands.
11. Fuchs, Z, 2013 [Large scale disturbances and convection. COST Atmospheric Convection and its Parametrization, Postira, RH](#)
12. 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.
13. Raymond, D, Saška Gjorgjievska, Sharon Sessions, Carlos López, Željka Fuchs: Vorticity, Moisture, and Precipitation in the Tropical Atmosphere. 2012 Workshop on Convection, Water Vapor, and Climate. Harvard University Center for the Environment
14. 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.
15. Fuchs, Z: Tropical disturbances, different closures and vertical structure. March, 2011, Cambridge, Great Britain. **Invited talk.**
16. Fuchs, Z: Convectively coupled Kelvin waves. October, 2010, CIMA, Savona, Italy. **Invited talk.**
17. 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.**
18. 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.
19. Fuchs, Z. and D. J. Raymond, 2007: Convective Inhibition and Dynamics in Convectively Coupled Kelvin Waves. IUGG. 2-13 July, 2007. Perugia, Italy.

20. 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
21. 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.
22. 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.
23. 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
24. Saska Gjorgjievaska, 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.
25. 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.
26. 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.
27. 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.
28. 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.
29. 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

- \* Co-PI on NSF project: Balanced flows and tropical convection, 2016-2019
- \* Partner on WindRisk, 2015-2016
- \* Project leader for Croatia on EU FP7 [EMBRACE](#) 2011-2016
- \* Collaborator on National Science Foundation (NSF) Project USA, 2014 – 2017
- \* Project leader on National Foundation for Science, Croatia (NZZ), 2011
- \* Collaborator on National Science Foundation (NSF) Project: A Rational Approach to Cumulus Parameterization in Large-Scale Models, USA, 2010 –2014
- \* Partner on 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), 2010
- \* Project leader on Science Festival for Split, 2010 – 2014
- \* Project leader on National Foundation for Science, Croatia (NZZ), 2009
- \* 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 –2012

- \* Collaborator on National Science Foundation (NSF) Project, USA, 2000 - 2006

## **SERVICE AND PROFESSIONAL ACTIVITIES**

- \* Manager for the field project Organization of Tropical East Pacific Convection (OTREC) 2019 pending NSF approval
- \* 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
- \* 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
- \* Organizer: Third Split Workshop in Atmospheric Physics and Oceanography SWAP (<http://fizika.pmfst.hr/TSWAP/>)
- \* Organizer: Second Split Workshop in Atmospheric Physics and Oceanography SWAP (<http://fizika.pmfst.hr/SSWAP/>)
- \* Organizer: First Split Workshop in Atmospheric Physics and Oceanography SWAP (<http://fizika.pmfst.hr/SWAP/>)
- \* Reviewer: Journal of the Atmospheric Sciences, Journal of Climate
- \* Member: American Meteorological Society
- \* Member: European Meteorological Society