

Martina Bramberger

NorthWest Research Associates, 3380 Mitchell Lane, Boulder CO, 80301
martina@nwra.com

Education

Technical University of Munich	Aeronautics and Aerospace	Dipl. Ing. 2010
Leopold Franzens University	Atmospheric Sciences	M.Sc. 2015
Ludwig-Maximilian University	Meteorology	Ph.D. 2019

Professional Experience

2021 – present	Research Scientist	NorthWest Research Associates
2019 – 2021	Postdoctoral Research Associate	NorthWest Research Associates
2015 – 2019	Graduate Research Assistant	German Aerospace Center (DLR)
2011 – 2013	Project Engineer	Euro Engineering, (MTU)
2010 – 2011	System Engineer	Manpower, (Airbus)

Field Campaigns

2021	Strateole-2 Long-duration Super-pressure Balloon Campaign, Seychelles <i>Role: Leading frost-point soundings</i>
2019	Strateole-2 Long-duration Super-pressure Balloon Campaign, Seychelles <i>Role: In charge of frost-point soundings</i>
2016	North Atlantic Waveguide and Downstream Impact Experiment (NAWDEX), Iceland <i>Role: In charge of radio soundings and CAT forecasting for the flight planning team</i>
2016	Gravity Wave Life Cycle (GW-LCYCLE) II, Sweden <i>Role: In charge of radio soundings and member of the flight planning team</i>
2014	Deep Propagating Gravity Wave Experiment, New Zealand <i>Role: Member of the Lauder radiosonde launch team</i>

Relevant Experience

Dr Bramberger's research interests include atmospheric dynamics, gravity waves and aviation meteorology with a special interest in numerical modeling of convection, waves, and climate. She has 6+ years of experience in analyzing gravity waves with modeling data and a diverse set of measurements comprising ground-based and airborne lidar, radar, balloon-borne, aircraft in situ, airglow and, space-born COSMIC 2 and AIRS observations. Together with Peter Bechtold through an invitation to visit the European Center for Mediumrange Weather Forecasting she has implemented an algorithm in their Integrated Forecasting System aimed toward forecasting of CAT due to breaking convective gravity waves. During her postdoctoral work at NWRA, she has developed new skills in numerical modeling with National Center for Atmospheric Research tools, the Weather Research Forecasting (WRF) model and the Whole Atmosphere Community Climate Model (WACCM). During that time she also gained experience in analyzing equatorial waves with balloon-borne observations. She has already worked in the industry in project management for next generation Embraer engine development. At the moment she is working together with Julio Bacmeister to improve the existing convective gravity wave parameterization in WACCM.

Awards & Accolades

Invited formal seminar, NOAA Geophysical Fluid Dynamics Laboratory: “High aspect ratio tropical waves near the Tropopause: Another class of missing waves in climate and forecast models”

Invited speaker, SPARC 2023 QBOi Symposium: “A data constrained method to parameterize convectively generated gravity wave drag in global circulation models”

Invited lecturer, Summer School TP-Change Project 2022, “Introduction to Turbulence”, Frankfurt, Germany

Invited visit to Ecole Polytechnique, Paris, France, 2022

Invited speaker, SPARC 2022 Gravity Wave Symposium: “First measurements of fine-vertical-scale wave impacts on the tropical lower stratosphere”

Invited speaker, CLIVAR summit meeting 2022: Strateole 2: “Investigating processes in the tropical tropopause layer with long-duration superpressure balloons”

Invited speaker, AGU 2019 Fall Meeting: “A Method for Realistic Simulation of Tropical Gravity Waves with Potential for near Real-Time Applications”, (Abstract ID 486253)

Outstanding Student Poster and PICO (OSPP) Award, European Geosciences Union (EGU) General Assembly, Vienna

Publications

Bramberger, M., Goetz, D., Alexander, M. J., Kalnajs, L., Hertzog, A., & Podglajen, A. (2023). *Tropical wave observations from the reel-down atmospheric temperature sensor (RATS) in the lowermost stratosphere during Strateole-2*. Geophys. Res. Letters, 50, e2023GL104711. <https://doi.org/10.1029/2023GL104711>

Goetz, J. D., Kalnajs, L. K., Deshler, T., Davis, S., Bramberger, M., and Alexander, M. J.: *A Fiber Optic Distributed Temperature Sensor for Continuous in situ Profiling 2 km Beneath Constant-altitude Scientific Balloons*, Atmos. Meas. Tech., <https://doi.org/10.5194/amt-16-791-2023>, 2023.

Lachnitt, H.-C., Hoor, P., Kunkel, D., Bramberger, M., Dörnbrack, A., Müller, S., Reutter, P., Giez, A., Kaluza, T., and Rapp, M.: *Gravity-wave-induced cross-isentropic mixing: a DEEPWAVE case study*, Atmos. Chem. Phys., 23, 355–373, <https://doi.org/10.5194/acp-23-355-2023>, 2023.

Cao, B., Haase, J. S., Murphy, M. J., Alexander, M. J., Bramberger, M., and Hertzog, A. (2022): *Equatorial waves resolved by balloon-borne Global Navigation Satellite System Radio*

Occultation in the Strateole-2 Campaign, EGU sphere, <https://doi.org/10.5194/egusphere-2022-381>.

Bramberger, M., Alexander, M. J., Davis, S., Podglajen, A., Hertzog, A., Kalnajs, L., et al. (2022): *First super-pressure balloon-borne fine-vertical-scale profiles in the upper TTL: Impacts of atmospheric waves on cirrus clouds and the QBO*. Geophysical Research Letters, 49, e2021GL097596. <https://doi.org/10.1029/2021GL097596>

Alexander, M. J., C. C. Liu, J. Bacmeister, M. Bramberger, A. Hertzog, and J. H. Richter, (2021): *Observational validation of parameterized gravity waves from tropical convection in the Whole Atmosphere Community Climate Model*. JGR-Atmospheres, 126, e2020JD033954. <https://doi.org/10.1029/2020JD033954>.

Bechtold, P., Bramberger, M., Dörnbrack, A., Leutbecher, M., Isaksen, L., (2021): *Forecasting Clear Air Turbulence*. ECMWF Newsletter, 168, <https://www.ecmwf.int/en/newsletter/168/meteorology/forecasting-clear-air-turbulence>

Bramberger, M., M. J. Alexander, A. W. Grimsdell, (2020): *Realistic Simulation of Tropical Atmospheric Gravity Waves Using Radar-Observed Precipitation Rate and Echo Top Height*, J. Adv. Model. Earth Syst., 12, <https://doi.org/10.1029/2019MS001949>

Wilms, H., Bramberger, M., Dörnbrack, A., (2020): *Observation and simulation of mountain wave turbulence above Iceland: Turbulence intensification due to wave interference*, Q J R Meteorol Soc., 1-21. <https://doi.org/10.1002/qj.3848>

Bramberger, M., A. Dörnbrack, H. Wilms, F. Ewald, R. Sharman, (2020): *Mountain Wave Turbulence Encounter of the Research Aircraft HALO above Iceland*, J. Appl. Meteor. Climatol., DOI: 10.1175/JAMC-D-19-0079.1.

Bossert, K., et al. (2020): *Observations of Stratospheric Gravity Waves Over Europe on 12 January 2016: The Role of the Polar Night Jet*, Journal of Geophysical Research: Atmospheres, 125, e2020JD032893. <https://doi.org/10.1029/2020JD032893>

Woiwode, W., et al. (2018): *Mesoscale fine structure of a tropopause fold over mountains*, Atmos. Chem. Phys., 18, 15643-15667, <https://doi.org/10.5194/acp-18-15643-2018>.

Schäfler, A., et al. (2018): *The North Atlantic Waveguide and Downstream Impact Experiment*. Bull. Amer. Meteor. Soc., 0, <https://doi.org/10.1175/BAMS-D-17-0003.1>.

Dörnbrack, A., Gisinger, S., Kaifler, N., Portele, T., Bramberger, M., Rapp, M., Gerding, M., Söder, J., Žagar, N., and Jelić, D., (2018): *Gravity Waves excited during a Minor Sudden Stratospheric Warming*, Atmos. Chem. Phys., <https://doi.org/10.5194/acp-2018-228>.

Bramberger, M., A. Dörnbrack, H. Wilms, S. Gamsa, K. Raynor, and R. Sharman, (2018): *Vertically Propagating Mountain Waves — A Hazard for High-Flying Aircraft?*. J. Appl. Meteor. Climatol., 57, 1957–1975, <https://doi.org/10.1175/JAMC-D-17-0340.1>.

Bramberger, M., et al., (2017). *Does Strong tropospheric forcing cause large-amplitude mesospheric gravity waves? A DEEPWAVE case study*. Journal of Geophysical Research: Atmospheres, 122, 11,422–11,443. <https://doi.org/10.1002/2017JD027371>.

Ehard, B., Kaifler B., Dörnbrack A., Preusse P., Eckermann S.D., Bramberger M., Gisinger S., Kaifler N., Liley B., Wagner J., Rapp M., (2017), *Horizontal propagation of large-amplitude mountain waves into the polar night jet*, J. Geophys. Res. Atmos., 122, 1423–1436, doi: 10.1002/2016JD025621.

Wagner, J., Dörnbrack, A., Rapp, M., Gisinger, S., Ehard, B., Bramberger, M., Witschas, B., Chouza, F., Rahm, S., Mallaun, C., Baumgarten, G., and Hoor, P., (2017): *Observed versus simulated mountain waves over Scandinavia – improvement of vertical winds, energy and momentum fluxes by enhanced model resolution?*, Atmos. Chem. Phys., 17, 4031-4052, <https://doi.org/10.5194/acp-17-4031-2017>.

Conference Presentations

2023 Bramberger M., Goetz D.J., M.J. Alexander, Kalnajs L., Deshler T., Hertzog A.: “3D analysis of tropical wave characteristics from the Reel-down Atmospheric Temperature Sensor (RATS) during the Stratoole-2 super-pressure balloon 2021 campaign”, AMS Annual Meeting, Denver, 8 -12 January

2022 Bramberger M., M.J. Alexander, Davis S., Podglajen A., Hertzog A., Kalnajs L., Deshler T., Goetz D.J., Khaykin S.: “First measurements of fine-vertical-scale wave impacts on the tropical lower stratosphere”, SPARC 2022 Gravity Wave Symposium, Frankfurt, 28 March – 1 April

Invited Presentation

Bramberger M., Goetz D.J., M.J. Alexander, Kalnajs L., Deshler T., Hertzog A.: “3D analysis of tropical wave characteristics from the Reel-down Atmospheric Temperature Sensor (RATS) during the Stratoole-2 super-pressure balloon 2021 campaign”, AGU Fall Meeting, Chicago, 12 -16 December

Presentation

Bramberger M., Alexander M.J., Bacmeister J., Corcos M., Hertzog A., Liu C.: “A data constrained method to parameterize convective gravity waves in global circulation models”, AGU Fall Meeting, Chicago, 12 -16 December

Presentation

2021 Bramberger M., M. J. Alexander, C. Liu, J. Bacmeister, A. Hertzog, J. Richter, and R. Vincent: “Getting Tropical Gravity Wave Details Right to Improve Global Forecast Models”, 34th Conference on Hurricanes and Tropical Meteorology (AMS), online, 10-14 May

Presentation

2019 Bramberger M., Alexander M. Joan, Grimsdell A.: “A Method for Realistic Simulation of Tropical Gravity Waves with Potential for near Real-Time Applications”, AGU Annual Meeting, San Francisco, 9-13 December.

Invited Presentation

- 2018 Bramberger M., Dörnbrack A., Wilms H., Sharman R., Schäfler A.: *Turbulence encounter by the research aircraft HALO above Iceland during NAWDEX - A case study to analyze the generation mechanism*, EGU General Assembly, Vienna, 8-13 April.

Poster

- 2017 Bramberger M., Dörnbrack A., Gemsa S., Raynor K., Sharman R., Wilms H.: *Mountain waves as hazard for high-flying aircraft? - A Case Study*, WMO Aeronautical Meteorology Scientific Conference (AeroMetSci-2017), Toulouse, 6-10 November.

Poster

Bramberger M., Dörnbrack A., Ehard B., Kaifler B., Kaifler N., Rahm S., Witschas B., Rapp M., Vosper S., Orr A., Williams B.P., Fritts D.C., Pautet P.D., Taylor M.J., and Mallaun C.: *Does strong tropospheric forcing cause large amplitude mesospheric gravity waves? A Deepwave Case Study*, EGU General Assembly, Vienna, 23-28 April.

Presentation

Bramberger M., Dörnbrack A., Rapp M., Gemsa S., Raynor K., Sharman R.: *Stall warning encounter of the HALO research aircraft caused by mountain waves*, EGU General Assembly, Vienna, 23-28 April. **Poster**

- 2016 Bramberger M., Dörnbrack A., Wagner J., Gisinger S., Kaifler B. + N., Ehard B., Rapp M., Vosper S. and Orr A.: *Does strong tropospheric forcing cause large amplitude mesospheric gravity waves? A Deepwave Case Study*, 3rd International ANtarctic Gravity Wave Instrument Network (ANGWIN) science workshop, Cambridge, 12-14 April, **Presentation**

Bramberger, M., A. Dörnbrack, J. Wagner, S. Gisinger, B. + N. Kaifler, B. Ehard, M. Rapp, I. Stiperski, and S. Vosper: *Does strong tropospheric forcing cause large amplitude mesospheric gravity waves? A Deepwave Case Study*, DACH Conference, Berlin, 14-18 March. **Presentation**

- 2015 Bramberger, M., A. Dörnbrack, Gisinger S., Kaifler B., Portele T., Rapp M., Stiperski I.: *Does strong tropospheric forcing cause large amplitude mesospheric gravity waves? A Deepwave Case Study*, 33rd International Conference on Alpine Meteorology, Innsbruck, 31 August – 4 September, **Poster**