

Matthias Zeeman | Curriculum Vitæ

Garmisch-Partenkirchen – Germany

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Summary

- Dynamic, curiosity driven researcher with a global mindset about the inclusion of ideas, people and techniques
- Passionate about team work, leveraging connections between people and disciplines
- Comfortable with taking the initiative to develop something new, advancing the state-of-the-art
- Experienced developer of laboratory analysis, experimental sensing and data sciences solutions

Experience

Researcher, Principal Investigator.....

Karlsruhe Institute of Technology **Garmisch-Partenkirchen, Germany**

Group of Prof. Dr. Stefan Emeis, IMK-IFU

Dec 2017 – current

- Fundamental research on scale interactions in the atmospheric boundary layer • [36–31, 29, 25]

Researcher, Post Doc.....

Karlsruhe Institute of Technology **Garmisch-Partenkirchen, Germany**

Group of Prof. Dr. Stefan Emeis, IMK-IFU

Dec 2016 – Nov 2017

Group of Dr. Matthias Mauder, IMK-IFU

Mar 2012 – Nov 2016

- Coordinate the ScaleX multi-disciplinary intensive observation campaigns (since 2016): Foster new research opportunities, (international) collaborations and visibility • [M1]
- Study boundary layer processes above complex urban terrain in Stuttgart (BMBF [UC]²)
- Study structure and motion in the atmosphere using (remote-) sensing networks • [24, 23]
- Investigate managed grassland functioning, sensitivity and productivity • [28–26, 22, 21, 19]
- Manage essential pre-Alpine observatory infrastructure and data (TERENO) • [30]

Researcher, Post Doc & Fellow.....

Oregon State University **Corvallis OR, USA**

Lab of Prof. Dr. Christoph Thomas, CEOAS

Oct 2009 – Apr 2011 (Fellow), May 2011 – Feb 2012

- Investigate near-surface turbulent structures in the atmospheric surface layer • [20, 17, 12] [M4]
- Study ecosystem–atmosphere exchange with novel flux analysis & stable isotopes • [16–14]

Researcher, Post Doc.....

Paul Scherrer Institute **Villingen, Switzerland**

Lab of Atmospheric Chemistry, Dr. Rolf Siegwolf

2009 (3 mo.)

- Develop a calibration system for stable isotope laser spectroscopy

Researcher, Post Doc.....

ETH Zurich **Zurich, Switzerland**

Lab of Terrestrial Ecosystem Physiology, Prof. Dr. Alexander Knohl

2009 (3 mo.)

- Evaluate novel stable isotope flux observations from a mixed mountain forest

Junior Researcher.....
Vrije Universiteit Amsterdam **Amsterdam, The Netherlands**
Group of Prof. Dr. Han Dolman *2003 (2 mo.), 2004*

- Develop a Land-surface Experiments database (ESA mission candidate SPECTRA)
- Maintain the Hostermeer (NLD) peatlands experimental station (CarboEurope IP)
- Maintain the Chokurdakh (RUS) arctic tundra station and train on-site researchers

Internship.....
Vrije Universiteit Amsterdam **Amsterdam, The Netherlands**
Group of Prof. Dr. Han Dolman *2002 (9 mo.)*

- Establish observatory stations in taiga forest, arctic tundra (RUS) and peatland (NLD)
- Develop a rugged field data-recording system • [1]

Education

ETH Zurich **Switzerland**
Dr.Sc. ETH Zurich *2005 – 2008*

Vrije Universiteit Amsterdam **The Netherlands**
M.Sc. Environmental Sciences *1997 – 2003*

Doctoral thesis

Title: Environmental processes affecting the carbon dioxide budget of grasslands along an elevational gradient in Switzerland

Supervisors: Prof. Dr. Nina Buchmann, Dr. PD Werner Eugster & Dr. Roland Werner

Description: An study on the sensitivity of managed grassland to climatic drivers, using stable isotope biogeochemistry concepts • [18, 13, 11–2] [T1]

Awards

German Research Foundation (DFG) **24 mo.**
Principal Investigator grant „Eigene Stelle“ *2016*

BASIN **2010**
Travel grant (SIBAE/BASIN conference, Ascona, Switzerland)

Swiss National Science Foundation (SNSF) **18 mo.**
Prospective Researcher grant (extension) *2010*
Prospective Researcher grant *2009*

ETH Zurich **ETH Medal award**
Doctoral Thesis award, top 8% *2009*

ETH Zurich **6 mo.**
Rectorate doctorate scholarship *2008*

Huber-Kudlich-Stiftung **2008**
Travel grant (Joint European Stable Isotope User Meeting, Hyères, France)
Travel grant (SOIHS summer school, Palermo, Italy) *2008*
Travel grant (AGU Fall Meeting, San Fransisco, USA) *2007*

ESF/SIBAE **2007**
Travel grant (SIBAE spring school, Vienna, Austria)

Teaching

Lecturer	
R for Beginners <i>IFU Programming Course, Garmisch-Partenkirchen, Germany</i>	<i>5–6 May 2017</i>
Climatological measurement techniques <i>KIT Course ‘Klimatologische Messverfahren’, Karlsruhe, Germany</i>	<i>17–18 May 2016</i>
Modeling of Land Surface – Atmosphere Interactions <i>MICMoR summer school, Garmisch-Partenkirchen, Germany</i>	<i>16–26 Aug 2015</i>
Flux Measurement Fundamentals <i>TU Munich Technical short course, Garmisch-Partenkirchen, Germany</i>	<i>2012, 2014, 2015</i>
Academic advisory	
PhD-student (KIT) on topic ‘boundary-layer dynamics’	<i>Sep 2015 – Nov 2018</i>
BSc-student (KIT) on topic ‘spatial temperature observations’	<i>May 2016 – Aug 2016</i>
BSc-student (KIT) on topic ‘farm methane emissions’	<i>Nov 2015 – Apr 2016</i>
MSc-student (TU Munich) on topic ‘grassland dynamics’	<i>May 2015 – Nov 2015</i>

Synergistic activities

Convener	
Workshop: ‘MOSES Heatwave Working Group’, 5–6 Feb 2019, Garmisch-Partenkirchen, Germany	
Workshop: ‘ScaleX’, 29–30 Mar 2017, Garmisch-Partenkirchen, Germany	
Sessions: AGU Fall Meeting, 5–9 Dec 2011, San Francisco, USA	
Sessions: AGU Fall Meeting, 13–17 Dec 2010, San Francisco, USA	
Workshop: ‘Daily work with stable isotope spectroscopy instruments’, 12 Dec 2010, Berkeley, USA	
Reviewer	
Journals: Agricultural and Forest Meteorology • Boundary-Layer Meteorology • Oecologia Journal of Hydrology • Atmospheric Measurement Techniques	
Miscellaneous	
Services: FLUXNET contributor • FLUXNET Young Scientist Network coordinator (2009–2011)	
Affiliations: American Geophysical Union • European Geosciences Union • FLUXNET	

Other skills and abilities

Language: English (fluent) • German (fluent) • Dutch (fluent)
Computing: Python • R • Matlab • Perl/RegEx • LabVIEW • NetCDF/CF • PHP/SQL • WCM/XML

Publications

Refereed Journal Articles

According to Web of Science, the following contributions were cited 900+ times, on average 30+ times per article, with an *h*-index of 17.

- [36] C. Hald, M. Zeeman, P. Laux, M. Mauder, and H. Kunstmann. “Large-eddy simulations of real world episodes in complex terrain based on ERA-Reanalysis and validated by ground-based remote sensing data”. In: *Monthly Weather Review* (Sept. 2019). DOI: 10.1175/mwr-d-19-0016.1.
- [35] E. Ibraim, B. Wolf, E. Harris, R. Gasche, J. Wei, L. Yu, R. Kiese, S. Eggleston, K. Butterbach-Bahl, M. Zeeman, B. Tuzson, L. Emmenegger, J. Six, S. Henne, and J. Mohn. “Attribution of N₂O sources in a grassland soil with laser spectroscopy based isotopocule analysis”. In: *Biogeosciences* 16.16 (Aug. 2019), pp. 3247–3266. DOI: 10.5194/bg-16-3247-2019.
- [34] P. Brugger, F. D. Roo, K. Kröniger, E. Rotenberg, F. Tatarinov, D. Yakir, M. Zeeman, and M. Mauder. “Contrasting turbulent transport regimes explain cooling effect in a semi-arid forest compared to surrounding shrubland”. In: *Agricultural and Forest Meteorology* 269-270 (May 2019), pp. 19–27. DOI: 10.1016/j.agrformet.2019.01.041.
- [33] A. Klosterhalfen, A. Graf, N. Brüggemann, C. Drüe, O. Esser, M. P. González-Dugo, G. Heinemann, C. M. J. Jacobs, M. Mauder, A. F. Moene, P. Ney, T. Pütz, C. Rebmann, M. R. Rodríguez, T. M. Scanlon, M. Schmidt, R. Steinbrecher, C. K. Thomas, V. Valler, M. J. Zeeman, and H. Vereecken. “Source partitioning of H₂O and CO₂ fluxes based on high-frequency eddy covariance data: a comparison between study sites”. In: *Biogeosciences* 16.6 (Mar. 2019), pp. 1111–1132. DOI: 10.5194/bg-16-1111-2019.
- [32] M. J. Zeeman, H. Shupe, C. Baessler, and N. K. Ruehr. “Productivity and vegetation structure of three differently managed temperate grasslands”. In: *Agriculture, Ecosystems & Environment* 270-271 (Feb. 2019), pp. 129–148. DOI: 10.1016/j.agee.2018.10.003.
- [31] P. Zhao, A. Hammerle, M. Zeeman, and G. Wohlfahrt. “On the calculation of daytime CO₂ fluxes measured by automated closed transparent chambers”. In: *Agricultural and Forest Meteorology* 263 (Dec. 2018), pp. 267–275. DOI: 10.1016/j.agrformet.2018.08.022.
- [30] R. Kiese, B. Fersch, C. Baessler, C. Brosy, K. Butterbach-Bahl, C. Chwala, M. Dannenmann, J. Fu, R. Gasche, R. Grote, C. Jahn, J. Klatt, H. Kunstmann, M. Mauder, T. Rödiger, G. Smiatek, M. Soltani, R. Steinbrecher, I. Völksch, J. Werhahn, B. Wolf, M. Zeeman, and H. Schmid. “The TERENO Pre-Alpine Observatory: Integrating Meteorological, Hydrological, and Biogeochemical Measurements and Modeling”. In: *Vadose Zone Journal* 17.1 (Nov. 2018), p. 0. DOI: 10.2136/vzj2018.03.0060.
- [29] C. Brenner, M. Zeeman, M. Bernhardt, and K. Schulz. “Estimation of evapotranspiration of temperate grassland based on high-resolution thermal and visible range imagery from unmanned aerial systems”. In: *International Journal of Remote Sensing* (May 2018), pp. 1–34. DOI: 10.1080/01431161.2018.1471550.
- [28] L. Hörtnagl, M. Barthel, N. Buchmann, W. Eugster, K. Butterbach-Bahl, E. Díaz-Pinés, M. Zeeman, K. Klumpp, R. Kiese, M. Bahn, A. Hammerle, H. Lu, L. Ladreiter-Knauss, S. Burri, and L. Merbold. “Greenhouse gas fluxes over managed grasslands in Central Europe”. In: *Global Change Biology* (Feb. 2018). DOI: 10.1111/gcb.14079.
- [27] M. Mauder, S. Genzel, J. Fu, R. Kiese, M. Soltani, R. Steinbrecher, M. Zeeman, T. Banerjee, F. De Roo, and H. Kunstmann. “Evaluation of energy balance closure adjustment methods by independent evapotranspiration estimates from lysimeters and hydrological simulations”. In: *Hydrological Processes* 32.1 (Jan. 2018), pp. 39–50. DOI: 10.1002/hyp.11397.
- [26] C. Klein, C. Biernath, F. Heinlein, C. Thieme, A. K. Gilgen, M. Zeeman, and E. Priesack. “Vegetation Growth Models Improve Surface Layer Flux Simulations of a Temperate Grassland”. In: *Vadose Zone Journal* 16.13 (Jan. 2018). DOI: 10.2136/vzj2017.03.0052.
- [25] M. Mauder and M. J. Zeeman. “Field intercomparison of prevailing sonic anemometers”. In: *Atmospheric Measurement Techniques* 11.1 (Jan. 2018), pp. 249–263. DOI: 10.5194/amt-11-249-2018.

- [24] C. Brosy, K. Krampf, M. Zeeman, B. Wolf, W. Junkermann, K. Schäfer, S. Emeis, and H. Kunstmann. “Simultaneous multicopter-based air sampling and sensing of meteorological variables”. In: *Atmospheric Measurement Techniques* 10.8 (Aug. 2017), pp. 2773–2784. doi: 10.5194/amt-10-2773-2017.
- [23] B. Wolf, C. Chwala, B. Fersch, J. Garvelmann, W. Junkermann, M. J. Zeeman, A. Angerer, B. Adler, C. Beck, C. Brosy, P. Brugger, S. Emeis, M. Dannenmann, F. D. Roo, E. Diaz-Pines, E. Haas, M. Hagen, I. Hajnsek, J. Jacobeit, T. Jagdhuber, N. Kalthoff, R. Kiese, H. Kunstmann, O. Kosak, R. Krieg, C. Malchow, M. Mauder, R. Merz, C. Notarnicola, A. Philipp, W. Reif, S. Reineke, T. Rödiger, N. Ruehr, K. Schäfer, M. Schrön, A. Senatore, H. Shupe, I. Völksch, C. Wanninger, S. Zacharias, and H. P. Schmid. “The SCALEX Campaign: Scale-Crossing Land Surface and Boundary Layer Processes in the TEREENO-preAlpine Observatory”. In: *Bulletin of the American Meteorological Society* 98.6 (June 2017), pp. 1217–1234. doi: 10.1175/bams-d-15-00277.1.
- [22] M. Zeeman, M. Mauder, R. Steinbrecher, K. Heidbach, E. Eckart, and H. Schmid. “Reduced snow cover affects productivity of upland temperate grasslands”. In: *Agricultural and Forest Meteorology* 232 (Jan. 2017), pp. 514–526. doi: 10.1016/j.agrformet.2016.09.002.
- [21] A. R. Desai, G. Wohlfahrt, M. J. Zeeman, G. Katata, W. Eugster, L. Montagnani, D. Gianelle, M. Mauder, and H.-P. Schmid. “Montane ecosystem productivity responds more to global circulation patterns than climatic trends”. In: *Environmental Research Letters* 11.2 (Feb. 2016), p. 024013. doi: 10.1088/1748-9326/11/2/024013.
- [20] M. J. Zeeman, J. S. Selker, and C. K. Thomas. “Near-Surface Motion in the Nocturnal, Stable Boundary Layer Observed with Fibre-Optic Distributed Temperature Sensing”. In: *Boundary-Layer Meteorology* 154.2 (Oct. 2015), pp. 189–205. doi: 10.1007/s10546-014-9972-9.
- [19] S. Fatichi, M. J. Zeeman, J. Fuhrer, and P. Burlando. “Ecohydrological effects of management on subalpine grasslands: From local to catchment scale”. In: *Water Resources Research* 50.1 (Jan. 2014), pp. 148–164. doi: 10.1002/2013wr014535.
- [18] P. Michna, W. Eugster, R. V. Hiller, M. J. Zeeman, and H. Wanner. “Topoclimatological case-study of Alpine pastures near the Albula Pass in the eastern Swiss Alps”. In: *Geographica Helvetica* 68.4 (Dec. 2013), pp. 249–263. doi: 10.5194/gh-68-249-2013.
- [17] L. Mahrt, C. Thomas, S. Richardson, N. Seaman, D. Stauffer, and M. Zeeman. “Non-stationary Generation of Weak Turbulence for Very Stable and Weak-Wind Conditions”. In: *Boundary-Layer Meteorology* 147.2 (Nov. 2012), pp. 179–199. doi: 10.1007/s10546-012-9782-x.
- [16] C. Werner, H. Schnyder, M. Cuntz, C. Keitel, M. J. Zeeman, T. E. Dawson, F.-W. Badeck, E. Brugnoli, J. Ghashghaie, T. E. E. Grams, Z. E. Kayler, M. Lakatos, X. Lee, C. Máguas, J. Ogée, K. G. Rascher, R. T. W. Siegwolf, S. Unger, J. Welker, L. Wingate, and A. Gessler. “Progress and challenges in using stable isotopes to trace plant carbon and water relations across scales”. In: *Biogeosciences* 9.8 (Aug. 2012), pp. 3083–3111. doi: 10.5194/bg-9-3083-2012.
- [15] M. J. Zeeman, W. Eugster, and C. K. Thomas. “Concurrency of Coherent Structures and Conditionally Sampled Daytime Sub-canopy Respiration”. In: *Boundary-Layer Meteorology* 146.1 (June 2012), pp. 1–15. doi: 10.1007/s10546-012-9745-2.
- [14] M. J. Zeeman, K. Tu, and A. Knohl. “Continuous operation of spectroscopy instruments for stable isotope analysis”. In: *Eos Trans. AGU* 92(46) (2011), p. 211. doi: 10.1029/2011E0250003.
- [13] R. Kindler, J. Siemens, K. Kaiser, D. C. Walmsley, C. Bernhofer, N. Buchmann, P. Cellier, W. Eugster, G. Gleixner, T. Grünwald, A. Heim, A. Ibrom, S. K. Jones, M. Jones, K. Klumpp, W. Kutsch, K. S. Larsen, S. Lehuger, B. Loubet, R. Mckenzie, E. Moors, B. Osborne, K. Pilegaard, C. Rebmann, M. Saunders, M. W. I. Schmidt, M. Schrumpf, J. Seyfferth, U. Skiba, J.-F. Soussana, M. A. Sutton, C. Tefs, B. Vowinckel, M. J. Zeeman, and M. Kaupenjohann. “Dissolved carbon leaching from soil is a crucial component of the net ecosystem carbon balance”. In: *Global Change Biol.* 17.2 (2011), pp. 1167–1185. ISSN: 1365-2486. doi: 10.1111/j.1365-2486.2010.02282.x.

- [12] C. K. Thomas, A. M. Kennedy, J. S. Selker, A. Moretti, M. H. Schroth, A. R. Smoot, N. B. Tuffiaro, and M. J. Zeeman. “High-Resolution Fibre-Optic Temperature Sensing: A New Tool to Study the Two-Dimensional Structure of Atmospheric Surface-Layer Flow”. In: *Boundary-Layer Meteorology* 142.2 (Nov. 2011), pp. 177–192. doi: 10.1007/s10546-011-9672-7.
- [11] M. J. Zeeman, R. Hiller, A. K. Gilgen, P. Michna, P. Plüss, N. Buchmann, and W. Eugster. “Management and climate impacts on net CO₂ fluxes and carbon budgets of three grasslands along an elevational gradient in Switzerland”. In: *Agricultural and Forest Meteorology* 150.4 (Apr. 2010), pp. 519–530. doi: 10.1016/j.agrformet.2010.01.011.
- [10] M. J. Zeeman, R. A. Werner, W. Eugster, R. T. W. Siegwolf, G. Wehrle, J. Mohn, and N. Buchmann. “Optimization of automated gas sample collection and isotope ratio mass spectrometric analysis of $\delta^{13}\text{C}$ of CO₂ in air”. In: *Rapid Communications in Mass Spectrometry* 22.23 (Dec. 2008), pp. 3883–3892. doi: 10.1002/rcm.3772.
- [9] J. Fritsche, G. Wohlfahrt, C. Ammann, M. Zeeman, A. Hammerle, D. Obrist, and C. Alewell. “Summertime elemental mercury exchange of temperate grasslands on an ecosystem-scale”. In: *Atmospheric Chemistry and Physics* 8.24 (Dec. 2008), pp. 7709–7722. doi: 10.5194/acp-8-7709-2008.
- [8] J. Mohn, M. Zeeman, R. Werner, W. Eugster, and L. Emmenegger. “Continuous field measurements of $\delta^{13}\text{C}$ -CO₂ and trace gases by FTIR spectroscopy”. In: *Isotopes in Environmental and Health Studies* 44.3 (Sept. 2008), pp. 241–251. doi: 10.1080/10256010802309731.
- [7] B. Tuzson, J. Mohn, M. Zeeman, R. Werner, W. Eugster, M. Zahniser, D. Nelson, J. McManus, and L. Emmenegger. “High precision and continuous field measurements of $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ in carbon dioxide with a cryogen-free QCLAS”. In: *Applied Physics B* 92.3 (June 2008), pp. 451–458. doi: 10.1007/s00340-008-3085-4.
- [6] J. Fritsche, D. Obrist, M. Zeeman, F. Conen, W. Eugster, and C. Alewell. “Elemental mercury fluxes over a sub-alpine grassland determined with two micrometeorological methods”. In: *Atmospheric Environment* 42.13 (Apr. 2008), pp. 2922–2933. doi: 10.1016/j.atmosenv.2007.12.055.
- [5] R. Hiller, M. J. Zeeman, and W. Eugster. “Eddy-Covariance Flux Measurements in the Complex Terrain of an Alpine Valley in Switzerland”. In: *Boundary-Layer Meteorology* 127.3 (Feb. 2008), pp. 449–467. doi: 10.1007/s10546-008-9267-0.
- [4] B. Tuzson, M. J. Zeeman, M. S. Zahniser, and L. Emmenegger. “Quantum cascade laser based spectrometer for in situ stable carbon dioxide isotope measurements”. In: *Infrared Physics & Technology* 51.3 (Jan. 2008), pp. 198–206.
- [3] W. Eugster, K. Zeyer, M. Zeeman, P. Michna, A. Zingg, N. Buchmann, and L. Emmenegger. “Methodical study of nitrous oxide eddy covariance measurements using quantum cascade laser spectrometry over a Swiss forest”. In: *Biogeosciences* 4.5 (Oct. 2007), pp. 927–939. doi: 10.5194/bg-4-927-2007.
- [2] W. Eugster and M. J. Zeeman. “Micrometeorological techniques to measure ecosystem-scale greenhouse gas fluxes for model validation and improvement”. In: *International Congress Series* 1293 (July 2006), pp. 66–75. doi: 10.1016/j.ics.2006.05.001.
- [1] M. K. van der Molen, M. J. Zeeman, J. Lebis, and A. Dolman. “EClog: A handheld eddy covariance logging system”. In: *Computers and Electronics in Agriculture* 51.1-2 (Apr. 2006), pp. 110–114. doi: 10.1016/j.compag.2005.12.002.

Theses.....

- [T1] M. J. Zeeman. “Environmental processes affecting the carbon dioxide budget of grasslands along an elevational gradient in Switzerland.” 978-3-909386-87-1. PhD thesis. ETH Zurich, 2008. doi: 10.3929/ethz-a-005766109.

Miscellaneous.....

- [M7] G. Katata, M. Mauder, M. J. Zeeman, R. Grote, and M. Ota. “Wintertime carbon uptake of managed temperate grassland ecosystems may influence grassland dynamics”. In: *Biogeosciences Discussions* (Sept. 2019), pp. 1–23. doi: 10.5194/bg-2019-305.

- [M6] M. Kunz, J. V. Lavric, R. Gasche, C. Gerbig, R. H. Grant, F.-T. Koch, M. Schumacher, B. Wolf, and M. Zeeman. “Surface flux estimates derived from UAS-based mole fraction measurements by means of a nocturnal boundary layer budget approach”. In: *Atmospheric Measurement Techniques Discussions* (Aug. 2019), pp. 1–35. DOI: 10.5194/amt-2019-221.
- [M5] A. Graf, A. Klosterhalfen, N. Arriga, C. Bernhofer, H. Bogen, N. Brüggemann, C. Brümmer, J. Chi, E. Cremonese, M. Cuntz, J. Silva Dušek, T. El-Madany, S. Fares, M. Fischer, L. Foltýnová, B. Gielen, P. Gottschalk, M. Gharun, S. Ghiasi, T. Grünwald, G. Heinemann, B. Heinesch, M. Heliasz, J. Holst, L. Hörtnagl, A. Ibrom, J. Ingwersen, G. Jurasinski, J. Klatt, A. Knohl, F. Koebsch, J. Konopka, M. Korkiakoski, N. Kowalska, P. Kremer, B. Kruijt, J. Leonard, A. De Ligne, B. Longdoz, V. Magliulo, I. Mammarella, G. Manca, M. Mauder, M. Migliavacca, M. Molder, P. Ney, M. Nilsson, E. Paul-Limoges, M. Peichl, A. Pitacco, A. Poyda, C. Rebmann, M. Roland, T. Sachs, M. Schmidt, F. Schrader, L. Siebicke, L. Šigut, E.-S. Tuittila, A. Varlagin, N. Vendrame, C. Vincke, I. Völksch, C. Wille, S. Weber, H.-D. Wizemann, M. Zeeman, and H. Vereecken. “Altered energy partitioning across terrestrial ecosystems in the European drought year 2018”. In: *Philosophical Transactions B* (submitted).
- [M4] M. J. Zeeman. *High-resolution air temperature observations near the surface using fiber-optic distributed temperature sensing*. ZENODO. 2013. URL: <http://dx.doi.org/10.5281/zenodo.7611>.
- [M3] S. Wolf, L. Kouteen, and M. Zeeman. “Growing the FLUXNET Community: The Young Scientists Network”. In: *Fluxletter* 4.1 (Apr. 2011), pp. 4–5.
- [M2] M. J. Zeeman, B. Tuzson, L. Emmenegger, A. Knohl, N. Buchmann, and W. Eugster. “Conditional CO₂ flux analysis of a managed grassland with the aid of stable isotopes”. In: *Biogeosciences Discussions* 6 (2009), pp. 3481–3510. DOI: 10.5194/bgd-6-3481-2009.
- [M1] M. J. Zeeman, ed. *ScaleX: scale-crossing intensive research campaigns*. Karlsruhe Institute of Technology. 2016–2019. URL: <https://scallex.imk-ifu.kit.edu>.

Conference Proceedings

- [C49] C. Holst, M. Zeeman, D. Leukauf, C. Muenkel, and S. Emeis. “Towards LES model validation comparing remote sensing data to simulations in Stuttgart”. In: *Kurzfassungen der Meteorologentagung DACH*. DACH2019-210. 2019.
- [C48] M. J. Zeeman. “ScaleX: multidisciplinary intensive campaigns in the TERENO-preAlpine observatory”. In: *Kurzfassungen der Meteorologentagung DACH*. DACH2019-281. 2019.
- [C47] M. Zeeman, C. Holst, C. Muenkel, and S. Emeis. “Urban boundary-layer structure in complex terrain: a case study”. In: *Kurzfassungen der Meteorologentagung DACH*. DACH2019-188. 2019.
- [C46] M. Zeeman. “Multi-scale observation of velocity and temperature structures”. In: *AGU Fall Meeting Abstracts*. B11J-04. 2019.
- [C45] “The TERENO-preAlpine Observatory: Integrating Meteorological, Hydrological and Biogeochemical Measurements”. In: *AGU Fall Meeting Abstracts*. A31D-06. 2019.
- [C44] M. Zeeman, C. Holst, C. Muenkel, and S. Emeis. “Urban boundary layer structure of Stuttgart observed by ground-based remote sensing”. In: *EMS Annual Meeting Abstracts*. Sept. 9, 2019.
- [C43] M. Zeeman, H. Shupe, C. Baessler, and N. Ruehr. “Vegetation structure and productivity of three temperate upland grasslands”. In: *EMS Annual Meeting Abstracts*. Sept. 9, 2019.
- [C42] M. Zeeman. “Multi-scale observation of velocity and temperature structures”. In: *EMS Annual Meeting Abstracts*. Sept. 9, 2019.
- [C41] M. Zeeman, C. Holst, and S. Emeis. “Boundary-layer development in a mountainous urban setting observed with ground-based remote sensing”. In: *International Conference on Alpine Meteorology Abstracts*. Sept. 3, 2019.
- [C40] L. Hörtnagl, M. Barthel, N. Buchmann, W. Eugster, K. Butterbach-Bahl, E. Díaz-Pinés, M. Zeeman, K. Klumpp, R. Kiese, M. Bahn, A. Hammerle, H. Lu, T. Ladreiter-Knauss, S. Burri, and L. Merbold. “Greenhouse gas fluxes over managed grasslands in Central Europe”. In: *Geophysical Research Abstracts*. Apr. 10, 2019.

- [C39] M. Zeeman, H. Shupe, C. Baessler, and N. Ruehr. "Management, species composition and productivity of three temperate upland grasslands". In: *Geophysical Research Abstracts*. Apr. 10, 2019.
- [C38] M. Zeeman, H. Shupe, C. Baessler, and N. Ruehr. "On the connectivity between management, species composition and productivity of temperate upland grasslands". In: *TERENO International Conference 2018 Contributions*. Oct. 10, 2018.
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- [C25] M. Mauder and M. Zeeman. "Field Intercomparison of Six Different Three-Dimensional Sonic Anemometers". In: *AGU Fall Meeting Abstracts*. A23B-0198. 2016.
- [C24] H. P. E. Schmid, M. J. Zeeman, M. Mauder, R. Steinbrecher, K. Heidbach, and E. Eckart. "Sensitivity of upland grasslands to management and climate forcing". In: *AGU Fall Meeting Abstracts*. B44A-01. 2016.

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- [C17] M. J. Zeeman, B. Adler, T. Banerjee, P. Brugger, F. D. Roo, S. Emeis, M. Mauder, K. Schäfer, H. P. E. Schmid, and B. Wolf. “Boundary layer dynamics in a small shallow valley near the Alps (ScaleX campaign)”. In: *AGU Fall Meeting Abstracts*. A41G-0135. Dec. 17, 2015.
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- [C15] O. T. Denmead, L. Heng, L. Mayr, M. Zeeman, and P. Cepuder. “Quantifying Soil Evaporation and Plant Transpiration from Plant Communities with Isotopes and Micrometeorology”. In: *31st Conference on Agricultural and Forest Meteorology*. 2014.
- [C14] A. R. Desai, G. Wohlfahrt, M. J. Zeeman, G. Katata, M. Mauder, and H. P. Schmid. “Ecosystem Greenhouse Gas Fluxes Respond Directly to Weather Not Climate: A Case Study on the Relationship of Global Atmospheric Circulation, Foehn Frequency, and Winter Weather to Northern Alps Regional Grassland Phenology and Carbon Cycling”. In: *AGU Fall Meeting Abstracts*. B41C-0046. 2014.
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- [C11] M. J. Zeeman, J. S. Selker, and C. K. Thomas. “Near the Surface Air Temperature Dynamics from Distributed Temperature Sensing”. In: *21st Symposium on Boundary Layers and Turbulence*. 2014.
- [C10] M. Zeeman, R. Steinbrecher, E. Eckart, K. Heidbach, and M. Mauder. “The influence of meteorological variability on the seasonal course of pre-Alpine managed grasslands”. In: *TERENO International Conference 2014 Book of Abstracts*. 2014.
- [C9] S. Fatichi, M. Zeeman, J. Fuhrer, and P. Burlando. “Effects of subalpine grassland management on hydrology and vegetation productivity”. In: *Geophysical Research Abstracts*. May 1, 2014.
- [C8] M. J. Zeeman, C. K. Thomas, B. E. Law, S. Eitzold, W. Eugster, and N. Buchmann. “Conditional Sampling of Sub-Canopy Respiration in Forests”. In: *AGU Fall Meeting Abstracts*. B23E-05. 2011.

- [C7] M. J. Zeeman, P. Sturm, S. Etzold, W. Eugster, N. Buchmann, A. Knohl, and C. K. Thomas. "A novel approach combining canopy flow analysis and stable isotopes to understand and quantify turbulent carbon exchange in forests". In: *Annual Meeting Proceedings American Meteorological Society*. Amer. Meteorol. Soc. 2010.
- [C6] M. J. Zeeman, A. Knohl, P. Sturm, N. Buchmann, and C. K. Thomas. "Conditional flux analysis and stable isotopes". In: *AGU Fall Meeting Abstracts*. B53C-0423. 2009.
- [C5] P. Sturm, M. Barthel, S. Etzold, W. Eugster, L. Gentsch, M. Zeeman, and A. Knohl. "Ecosystem Fluxes of Stable Isotopes in Carbon Dioxide and Water Vapor Above a Forest Measured by Laser Spectroscopy". In: *AGU Fall Meeting Abstracts*. B23C-0446. 2008.
- [C4] B. Tuzson, J. Mohn, M. J. Zeeman, R. A. Werner, W. Eugster, and L. Emmenegger. "QCLAS: A compact isotopologue specific analyzer for atmospheric CO₂". In: *Geophysical Research Abstracts*. A0342. 2008.
- [C3] M. J. Zeeman, B. Tuzson, W. Eugster, R. A. Werner, N. Buchmann, and L. Emmenegger. "Grassland Stable Isotope Flux Measurements: Three Isotopomers of Carbon Dioxide Measured by QCL Spectroscopy". In: *AGU Fall Meeting Abstracts*. B13B-1199. 2007.
- [C2] W. Eugster, M. Zeeman, R. Häsler, and N. Buchmann. "The ETH Flux Research Network ("Swiss Fluxnet")". In: *AGU Fall Meeting Abstracts*. B41G-05. 2006.
- [C1] M. J. Zeeman, J. Mohn, B. Tuzson, W. Eugster, R. A. Werner, L. Emmenegger, and N. Buchmann. "Stable carbon dioxide isotopes for partitioning grassland fluxes: a comparison of Mass Spectrometric and Spectroscopic (FTIR and QCL) techniques". In: *AGU Fall Meeting Abstracts*. B41B-0190. 2006.

Presentations

Oral Presentations

- [P82] "Multi-scale observation of velocity and temperature structures". AGU Fall Meeting. San Francisco, USA, Dec. 11, 2019.
- [P81] "Multiscale observation of motion and temperature structures". KIT/IMK-IFU Institute Seminar. Garmisch-Partenkirchen, Germany, Nov. 19, 2019.
- [P80] "MOSES at ScaleX: Übersicht ScaleX 2019". MOSES Workshop. Bonn, Germany, Oct. 29, 2019.
- [P79] "MOSES at ScaleX: Gruppe „KIT Garmisch/Karlsruhe“". MOSES Workshop. Bonn, Germany, Oct. 29, 2019.
- [P78] "Multi-scale observation of velocity and temperature structures". EMS Annual Meeting. Copenhagen, Denmark, Sept. 13, 2019.
- [P73] "Management, species composition and productivity of three temperate upland grasslands". KIT/IMK-IFU Institute Seminar. Garmisch-Partenkirchen, Germany, Apr. 2, 2019.
- [P70] "ScaleX for MOSES". MOSES Workshop. Garmisch-Partenkirchen, Germany, Feb. 5, 2019.
- [P69] "Connecting R and Python for fast file access". Workshop on Tools to improve your computing workflow. Garmisch-Partenkirchen, Germany, Jan. 9, 2019.
- [P68] "Temperate grasslands along an elevation–management gradient". Grassland Science and Renewable Plant Resources Colloquium, University of Kassel. Witzenhausen, Germany, Dec. 19, 2018.
- [P67] "On the connectivity between management, species composition and productivity of temperate upland grasslands". TERENO International Conference. Berlin, Germany, Oct. 10, 2018.
- [P66] "ScaleX: framework, organisation, data management and campaign planning for 2019". Project meeting Helmholtz-Gemeinschaft MOSES AG Hitzewelle. Berlin, Germany, Oct. 8, 2018.
- [P65] "StadtKlima Stuttgart: High resolution Urban windfield and Urban–Rural interactions (updated)". 4th BMBF [UC]² B–3DO General Assembly. Stuttgart, Germany, Nov. 22, 2017.
- [P64] "StadtKlima Stuttgart: Observation Period 1 & 2". 4th BMBF [UC]² B–3DO Stuttgart Workgroup Assembly. Stuttgart, Germany, Nov. 22, 2017.

- [P62] “ScaleX: Multidisciplinary intensive campaigns in the TERENO–preAlpine observatory”. 10th TERENO Workshop. Garmisch-Partenkirchen, Germany, Sept. 29, 2017. [Invited](#).
- [P61] “StadtKlima Stuttgart: High resolution Urban windfield and Urban–Rural interactions”. 3th BMBF [UC]² B–3DO General Assembly. Hanover, Germany, June 19, 2017.
- [P60] “R for Beginners — Part III”. IFU Programming Course. Garmisch-Partenkirchen, Germany, Apr. 6, 2017.
- [P59] “StadtKlima Stuttgart: Observation Period 1”. 3th BMBF [UC]² B–3DO Stuttgart Workgroup Assembly. Stuttgart, Germany, Apr. 4, 2017.
- [P58] “The impact of complex terrain on biosphere–atmosphere exchange processes”. 3th ScaleX Workshop. Garmisch-Partenkirchen, Germany, Mar. 29, 2017.
- [P54] “Multi-scale observation and modelling of energy and matter exchange in the atmospheric boundary-layer (ScaleX Campaigns)”. AGU Fall Meeting. San Francisco, USA, Dec. 14, 2016.
- [P52] “Analysis of atmospheric flow in mountainous terrain using multi-scale observations and dimension-reduction techniques”. AGU Fall Meeting. San Francisco, USA, Dec. 12, 2016.
- [P50] “Combining in-situ and ground-based remote sensing observation: how to connect the dots?”. Meteorologentagung DACH. Berlin, Germany, Mar. 17, 2016.
- [P49] “Sensitivity of upland grasslands to management and climate forcing”. Meteorologentagung DACH. Berlin, Germany, Mar. 17, 2016.
- [P46] “The impact of complex terrain on biosphere–atmosphere exchange processes: what we learned from ScaleX 2015”. 2nd ScaleX Workshop. Garmisch-Partenkirchen, Germany, Feb. 10, 2016.
- [P45] “The ScaleX campaign: observations crossing scales in the TERENO preAlpine observatory”. 9th TERENO Workshop. Oberpfaffenhofen, Germany, Oct. 26, 2015.
- [P43] “Missing data techniques (GAP-filling)”. Short Course on “EC Flux Measurement Fundamentals”. Garmisch-Partenkirchen, Germany, July 31, 2015.
- [P42] “QA/QC – Flux Calculations, Adjustments, and Validity”. Short Course on “EC Flux Measurement Fundamentals”. Garmisch-Partenkirchen, Germany, July 30, 2015.
- [P41] “Recent developments in the use of DTS to monitor atmospheric flows”. AGU Fall Meeting. San Francisco, USA, Dec. 18, 2014. [Invited](#).
- [P38] “Near the surface air temperature dynamics from fiber-optic temperature sensing”. MICMoR Summer School. Garmisch-Partenkirchen, Germany, July 29, 2014.
- [P36] “Near the surface air temperature dynamics from fiber-optic temperature sensing”. AMS 21st Symposium on Boundary Layers and Turbulence. Leeds, UK, June 13, 2014.
- [P35] “Near the surface air temperature dynamics from fiber-optic temperature sensing”. FLAIR 2014 - Field Laser Applications in Industry and Research. Pratolino, Italy, May 5, 2014.
- [P34] “A second look at TERENO grassland data: towards a TERENO grassland comparison”. TERENO CT Atmosphere General Assembly. Würzburg, Germany, Jan. 20, 2014.
- [P33] “QA/QC: slow-response data”. TERENO CT Atmosphere General Assembly. Würzburg, Germany, Jan. 20, 2014.
- [P32] “QA/QC: gap-filling strategies and uncertainty”. TERENO CT Atmosphere General Assembly. Würzburg, Germany, Jan. 20, 2014.
- [P31] “High resolution temperature observations: a case study on weak-wind conditions near the surface”. KIT/IMK-IFU Institute Seminar. Garmisch-Partenkirchen, Germany, Dec. 13, 2013.
- [P30] “Can we distinguish anomalies in land fluxes from business as usual?”. ESA–iLEAPS Science Consultation Workshop. Munich, Germany, June 13, 2013.
- [P29] “A first look at TERENO grassland data”. TERENO CT Atmosphere General Assembly. Würzburg, Germany, Jan. 20, 2013.

- [P28] “Guest Lecture: Stable isotopes in Atmospheric Environmental Research”. Short Course on EC Flux Measurement Fundamentals. Garmisch-Partenkirchen, Germany, Aug. 3, 2012.
- [P27] “Research Career Pathways”. KIT/IMK-IFU PhD Seminar Series. Garmisch-Partenkirchen, Germany, July 5, 2012.
- [P26] “Turbulent exchange processes at the ecosystem scale”. KIT/IMK-IFU Division Meeting. Garmisch-Partenkirchen, Germany, June 21, 2012.
- [P25] “An experimentalist perspective on stable isotope spectroscopy”. Thermo-Fischer. Bremen, Germany, May 15, 2012.
- [P24] “Conditional sampling of sub-canopy respiration in forests”. AGU Fall Meeting. San Francisco, USA, Dec. 6, 2011.
- [P23] “Continuous field observations of stable isotope abundance (“Getting the data”)”. Workshop. UC Berkeley, USA, Dec. 12, 2010.
- [P22] “A novel approach combining canopy flow analysis and stable isotopes to understand and quantify turbulent carbon exchange in forests”. American Meteorological Society joint meeting. Keystone, CO, USA, Aug. 5, 2010. Presented by Christoph Thomas.
- [P21] “Stable isotopes and conditional flux analysis”. Conference “Stable Isotopes and Biogeochemical Cycles in Terrestrial Ecosystems”. Ascona, Switzerland, Mar. 23, 2010. [Invited](#).
- [P19] “Stable isotopes in water and carbon cycles”. Oregon State University “ATS-564 Course” Guest Lecture. Corvallis, USA, Nov. 16, 2009.
- [P18] “Conditional eddy flux & stable isotopes”. Paul Scherrer Institute “Atmospheric Chemistry Seminar”. Villigen, Switzerland, Oct. 10, 2009.
- [P16] “Environmental processes affecting the carbon dioxide budget of grasslands along an elevational gradient in Switzerland; a Swiss Fluxnet site comparison”. Swiss Fluxnet Workshop. Baden, Switzerland, Jan. 15, 2009.
- [P15] “Environmental processes affecting the carbon dioxide budget of grasslands along an elevational gradient in Switzerland”. Public PhD Defense. Zurich, Switzerland, Dec. 10, 2008.
- [P14] “Alpine grasslands – what happens to the ecosystem carbon exchange when conditions change”. Institute of Plant Sciences Colloquium. Zurich, Switzerland, Oct. 28, 2008.
- [P11] “Effect of fall/winter warm phase 2006-2007”. The Joint Baden Workshop Series. Baden, Switzerland, Nov. 30, 2007.
- [P8] “Quantification of Alpine grassland CO₂ budgets”. EGU General Assembly. Vienna, Austria, Apr. 18, 2007.
- [P7] “Grassland greenhouse gas exchanges & stable isotopes flux partitioning”. SIBAE Spring School. Vienna, Austria, Apr. 5, 2007.
- [P5] “Grassland greenhouse gas exchanges”. Seminar “Current Topics in Grassland Sciences”. Zurich, Switzerland, Oct. 30, 2006.
- [P4] “Grassland greenhouse gas exchanges in Switzerland”. Abisko Research Station Seminar. Abisko, Sweden, Sept. 25, 2006.
- [P1] “Environmental processes affecting the GHG budget of grasslands in an elevational transect in Switzerland”. Grassland Group Seminar. Zurich, Switzerland, May 30, 2005.

Poster Presentations

- [P77] “Urban boundary layer structure of Stuttgart observed by ground-based remote sensing”. EMS Annual Meeting 2019. Copenhagen, Denmark, Sept. 9, 2019.
- [P76] “Vegetation structure and productivity of three temperate upland grasslands”. EMS Annual Meeting. Copenhagen, Denmark, Sept. 9, 2019.

- [P75] “Boundary-layer development in a mountainous urban setting observed with ground-based remote sensing”. 35th International Conference on Alpine Meteorology 2019. Riva del Garda, Italy, Sept. 3, 2019.
- [P74] “Management, species composition and productivity of three temperate upland grasslands”. EGU General Assembly. Vienna, Austria, Apr. 10, 2019.
- [P72] “Urban boundary-layer structure in complex terrain: a case study”. Meteorologentagung DACH. Garmisch-Partenkirchen, Germany, Mar. 20, 2019.
- [P71] “ScaleX: multidisciplinary intensive campaigns in the TERENO-preAlpine observatory”. Meteorologentagung DACH. Garmisch-Partenkirchen, Germany, Mar. 20, 2019.
- [P63] “Reduced snowcover affects productivity of upland temperate grasslands”. 10th TERENO Workshop. Garmisch-Partenkirchen, Germany, Sept. 29, 2017.
- [P57] “Zeeman’s ScaleX contributions: overview & status”. 3th ScaleX Workshop. Garmisch-Partenkirchen, Germany, Mar. 29, 2017.
- [P56] “ScaleX is in motion: 2015 – 2017”. 3th ScaleX Workshop. Garmisch-Partenkirchen, Germany, Mar. 29, 2017.
- [P55] “Boundary layer dynamics in a small shallow valley near the Alps (ScaleX campaign)”. AGU Fall Meeting. San Fransisco, USA, Dec. 2016. Presented by M. Mauder.
- [P53] “Field intercomparison of six different three-dimensional sonic anemometers”. AGU Fall Meeting. San Francisco, USA, Dec. 13, 2016.
- [P51] “Boundary layer dynamics in a small shallow valley near the Alps (ScaleX campaign)”. EGU General Assembly. Vienna, Austria, Apr. 2016. Presented by M. Mauder.
- [P48] “Boundary layer dynamics in a small shallow valley near the Alps (ScaleX campaign)”. Meteorologentagung DACH. Berlin, Germany, Mar. 17, 2016.
- [P47] “Evaluation of scan-patterns for a triple Doppler lidar setup”. Meteorologentagung DACH. Berlin, Germany, Mar. 17, 2016.
- [P44] “Evaluation of scan-patterns for a triple Doppler lidar setup”. TERENO Workshop “Remote sensing and soil”. Oberpfaffenhofen, Germany, Oct. 26, 2015.
- [P40] “The influence of meteorological variability on the seasonal course of pre-Alpine managed grasslands”. TERENO International Conference 2014. Bonn, Germany, Sept. 29, 2014.
- [P39] “The influence of meteorological variability on the seasonal course of pre-Alpine managed grasslands”. 1st ICOS International Conference on Greenhouse Gases and Biogeochemical Cycles. Brussels, Belgium, Sept. 23, 2014. Presented by R. Steinbrecher.
- [P37] “Temperaturmessung mit Licht”. KIT/IMK-IFU Tag der offenen Tür. Garmisch-Partenkirchen, Germany, July 18, 2014.
- [P20] “Conditional flux and stable isotopes”. AGU Fall Meeting. San Fransisco, USA, Dec. 18, 2009.
- [P17] “Conditional flux and stable isotopes”. International conference on “Atmospheric Transport and Chemistry in Forest Ecosystems” (IC EGER). Turnau, Germany, Oct. 5–8, 2009.
- [P13] “Grassland stable isotope fluxes of CO₂”. Joint European Stable Isotope User Meeting JESIUM. Presqûle de Giens, France, Aug. 31–Sept. 5, 2008.
- [P12] “Grassland stable isotope flux measurements: three isotopomers of carbon dioxide measured by QCL spectroscopy”. AGU Fall Meeting. San Francisco, USA, Dec. 11, 2007.
- [P10] “Quantification of Alpine grassland CO₂ exchange”. CarboEurope IP Meeting 2007. Poznan, Poland, Oct. 7–12, 2007.
- [P9] “Quantification of Alpine grassland CO₂ exchange”. NCCR Climate Summer School 2007. Grindelwald, Switzerland, Aug. 26–31, 2007.
- [P6] “Using stable isotopes in flux partitioning of grassland systems: a comparison of isotope ratio mass spectrometry, FTIR and tuneable Quantum Cascade Laser approaches”. Open Science Conference on the GHG Cycle in the Northern Hemisphere. Sissi-Lasshiti, Crete, Nov. 14–18, 2006.

- [P3] "Greenhouse gas exchange of grassland in an elevational transect". PSC Symposium on Plant Genome Evolution and Regulation. Zurich, Switzerland, Dec. 16, 2005.
- [P2] "Greenhouse gas exchange of grassland in an elevational transect". ETH Institute of Plant Sciences PhD Symposium. Kappel am Albis, Switzerland, Oct. 20, 2005.