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## Research profile

I am investigating the processes that underlie biosphere-atmosphere exchange at the local to regional scale. Of specific interest are the effects of disturbances in time (environmental change, management) on source-sink relationships in the carbon, water and nitrogen cycles of ecosystems, as well as the mechanisms of turbulent exchange with the atmosphere. Key notion is the importance of understanding the processes at the scale of landscape elements – ecosystems – first, in order to make accurate predictions at the larger regional and global scales.

For this interdisciplinary research I work with concepts, tools and theory from the fields of atmospheric sciences, biogeochemistry and plant-ecosystem physiology, combined with technological innovations and signal analysis.

## Professional experience

- 2012 Mar–today **Researcher**, *Karlsruhe Institute of Technology (KIT/IMK-IFU)*, Germany.  
Atmospheric Environmental Research. Fixed-term positions, including paternity leave.
- 2011 May–2012 Feb **Researcher**, *Oregon State U. (Col. of Oceanic and Atmospheric Sciences)*, USA.  
Research Associate. Observing near-surface turbulence and submeso-scale structures in the atmospheric surface layer using fiber-optic temperature sensing and image velocimetry.
- 2009 Oct–2011 Mar **PostDoc Fellow**, *Oregon State U. (Col. of Oceanic and Atmospheric Sci.)*, USA.  
Courtesy Faculty, Swiss National Science Foundation grant: “Determining ecosystem-scale component carbon dioxide fluxes: a new approach combining conditional flux analysis with stable isotopes.”
- 2009 Jul–Sep **PostDoc**, *Paul Scherrer Institute (Lab of Atmospheric Chemistry)*, Switzerland.  
Co-development of a calibration system for stable isotope laser spectroscopy.
- 2009 Feb–Apr **PostDoc**, *ETH Zurich (Terrestrial Ecosystem Physiology)*, Switzerland.  
Analysis of eddy covariance stable isotope flux data from a mixed mountain forest.
- 2004 **Junior researcher**, *Vrije Universiteit Amsterdam (Ecohydrology)*, The Netherlands.  
Maintaining the Hostermeer wetlands experimental site (CarboEurope IP) and the establishment of a database on Landsurface Experiments (SPECTRA mission, ESA)
- 2003 Apr–May **Junior researcher**, *Vrije Universiteit Amsterdam (Ecohydrology)*, The Netherlands.  
Assistant in the establishment of the Chokurdakh eddy flux monitoring site (TCOS, Siberian tundra) and transfer of relevant knowledge to local co-workers.

## Education

- 2005–2008 **Dr.Sc.**, *ETH Zurich (Institute of Plant Sciences, Grassland group)*, Switzerland.  
Thesis: “Environmental processes affecting the carbon dioxide budget of grasslands along an elevational gradient in Switzerland”. A specialisation in stable-isotope biogeochemistry.
- 1997–2003 **M.Sc. Environmental Sciences**, *Vrije Universiteit Amsterdam*, The Netherlands.  
Specialisation: Ecohydrology. Relevant courses: combination of hydrology, biology and environmental management, specialization in micrometeorology.
- 2002 Apr–Dec **Internship**, *Vrije Universiteit Amsterdam*, The Netherlands.  
Involved in the establishment of a micrometeorological experiment site on a Dutch wetland and in a Siberian taiga forest. Co-development of an Arctic field data-logging system.

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## Awards

- 2010 **Prospective Researcher grant**, *Swiss National Science Foundation*, 6 months.
- 2010 **Travel grant**, *BASIN*, Contribution to SIBAE/BASIN meeting, Ascona, Switzerland.
- 2009 **ETH Medal award**, *ETH Zurich*, **Doctoral Thesis award (top 8%)**.
- 2009 **Prospective Researcher grant**, *Swiss National Science Foundation*, 12 months.
- 2008 **Research grant**, *ETH Zurich*, Rectorate doctorate scholarship.
- 2008 **Travel grant**, *Huber-Kudlich-Stiftung*, SOIHS summer school, Palermo, Italy.
- 2007 **Travel grant**, *ESF/SIBAE*, SIBAE spring school, Vienna, Austria.
- 2007 **Travel grant**, *Huber-Kudlich-Stiftung*, AGU fall meeting, San Fransisco, USA.

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## Selected publications

1. **Zeeman MJ**, Selker JS, Thomas CK. Near-surface motion in the nocturnal, stable boundary layer observed with fibre-optic distributed temperature sensing. *Boundary-layer Meteorol.*, 154, 189-205, 2015.
2. **Zeeman MJ**, Eugster W, Thomas CK. Concurency of coherent structures and conditionally sampled daytime sub-canopy respiration. *Boundary-layer Meteorol.*, 146:1, 1-15, 2013.
3. Werner C, Schnyder H, Cuntz M, Keitel C, **Zeeman MJ**, Dawson T, Badeck F, Brugnoli E, Cohn B, Ghashghaie J, Grams TEE, Kayler ZE, Lakatos M, Lee X, Máguas, C, Ogée J, Rascher KG, Siegwolf R, Unger S, Welker J, Wingate L, Gessler A. Progress and challenges using stable isotopes to trace plant carbon and water relations across scales. *Biogeosciences*, 9, 3083-3111, 2012.
4. **Zeeman MJ**, Hiller R, Gilgen AK, Michna P, Pluess P, Buchmann N, Eugster W. Management and climate impacts on net CO<sub>2</sub> fluxes and carbon budgets of three grasslands along an elevational gradient in Switzerland. *Agric. For. Meteorol.*, 150:519–530, 2010.

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## Teaching

- Lecturer Technical short course on “Flux Measurement Fundamentals”, Garmisch-Partenkirchen, in 2012, 2014 and 2015.
- Lecturer MICMoR summer school on “Modeling of Land Surface – Atmosphere Interactions”, Garmisch-Partenkirchen, 16–26 Aug 2015.
- Academic Advisor to a PhD-student (KIT), topic “boundary-layer dynamics”, since Sep 2015.  
advisory Advisor to a MSc-student (TU Munich), topic “grassland dynamics”, since May 2015.  
Advisor to a BSc-student (KIT), topic “farm methane emissions”, since Nov 2015.

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## Synergistic activities

- Journal review Agricultural and Forest Meteorology; Boundary-Layer Meteorology; Journal of Hydrology; Oecologia; Atmospheric Measurement Techniques.
- Meeting convening Workshop “Daily work with stable isotope spectroscopy instruments”, 12 Dec 2010, UC Berkeley (USA); Conference sessions AGU Fall Meeting (13–17 Dec 2010; 5–9 Dec 2011).
- Services FLUXNET contributor; FLUXNET Young Scientist Network coordinator (2009–2011).
- Affiliations American Geophysical Union; European Geosciences Union; FLUXNET.

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## Other skills and abilities

- Language English (fluent), German (good), Dutch (fluent).  
Python, R, Matlab, Perl, NetCDF/HDF, SQL, LabVIEW, C, PHP.