

Jan Kleissl

Postdoctoral Fellow and Assistant Adjunct Professor
Michigan Technological University
Department of Civil and Environmental Engineering
1400 Townsend Dr., Houghton, MI, 49931-1295
ph: (906) 370-0509, e-mail: kleissl@mtu.edu

Research Interests

Environmental Fluid Mechanics, Applied Mathematics, Wireless Sensor Networks

Education

PhD. Johns Hopkins University, Department of Geography and Environmental Engineering, Baltimore, MD, January 2004

- Advisors: Marc B. Parlange, Charles Meneveau
- Dissertation: Field experimental study of the Smagorinsky model and application to Large Eddy Simulation

M.Sc. University of Stuttgart, Stuttgart, Germany, 2001, Water Resources Engineering and Management, Advisor: Prof. Dr.-Ing. Habil. Dr. rer. nat. A. Bardossy

- Thesis: Applicability of Taylor's Hypothesis to Atmospheric Boundary Layer Field Measurements of Subgrid-Scale Stresses

Dipl. Ing. ('Diplom Ingenieur' = graduate engineer), University of Stuttgart, Stuttgart, Germany, 2000, Environmental Engineering (Umweltschutztechnik), Advisor: Prof. Dr. h.c. Dr.-Ing. Helmut Kobus, PhD.

Employment

Postdoctoral Fellow, Michigan Technological University, Advisor: Richard Honrath, start: January 2004

Objectives: Field-experimental and numerical study of upslope and downslope flow events for source attribution of ground-based trace-gas measurements in the remote North Atlantic free troposphere

Awards and Fellowships

- **2004 UCAR Award for Outstanding Publication:**
Horst T.W., J. Kleissl et al: Field observations to obtain spatially filtered turbulence fields from crosswind arrays of sonic anemometers in the atmospheric surface layer, *J. Atmos. Sci.*, 61, 1566-1581, 2004
- **Student Paper Award:** 15th Symposium on boundary layers and turbulence, American Meteorological Society, Wageningen, The Netherlands, July 2002
- **Research Assistantship:** Johns Hopkins University; Department of Geography and Environmental Engineering, 2000-2003

Teaching Experience

- **Instructor:** Applied Boundary Layer Meteorology, S2005, Michigan Technol. Univ.
- **Co-Instructor:** Applied Mathematics for Engineering (total 15 lectures S2001-F2002), The Johns Hopkins University (JHU)
- **Teaching Assistant** in the courses: Applied Mathematics for Engineering (graduate, F2002, F2001, S2001), Hydrology (graduate, F2000), JHU

Publications

- **Kleissl, J.**, C. Meneveau, and M. B. Parlange, 'On the magnitude and variability of subgrid-scale eddy-diffusion coefficients in the atmospheric boundary layer,' *J. of the Atmospheric Sciences*, 60, 2372-2388, 2003
- **Kleissl, J.**, M. B. Parlange, and C. Meneveau, 'Field experimental study of dynamic Smagorinsky models in the atmospheric surface layer,' *J. Atmos. Sci.*, 61, 2296-2307, 2004
- **Kleissl, J.**, V. Kumar, M. B. Parlange, and C. Meneveau, 'Numerical study of dynamic Smagorinsky models in Large Eddy Simulation of the atmospheric boundary layer,' *submitted to J. of Hydrometeorology*
- **Kleissl J.**, M. Adam, V. Kumar, M. Pahlow, C. Higgins, E. Bou-Zeid, M.B. Parlange, J.M. Ondov, 'Meteorological conditions conducive to elevated PM_{2.5} concentrations during the Baltimore Supersite Experiment,' *in preparation*
- Pahlow, M, **J. Kleissl**, M.B. Parlange, J.M. Ondov, and D. Harrison, 'Atmospheric boundary layer dynamics as observed during a haze event due to forest fire smoke,' *Boundary Layer Meteorology*, 114 (1), 53-70, 2005
- Horst, T.W., **J. Kleissl**, D.H. Lenschow, C. Meneveau, C.-H. Moeng, M.B. Parlange, P.P. Sullivan, and J.C. Weil, 'Field observations to obtain spatially-filtered turbulence fields from transverse arrays of sonic anemometers in the atmospheric surface layer,' *J. Atmos. Sci.*, 61, 1566-1581, 2004
- A. Sapkota, J. M. Symons, **J. Kleissl**, L. Wang, M.B. Parlange, J. Ondov, P.A. Eggleston, T.J. Buckley, 'Impact of the 2002 forest fires on PM air quality in Baltimore City,' *Environment, Science and Technology*, 39 (1): 24-32, 2005
- R.E. Honrath, R.C. Owen, M. Val Martin, J.S. Reid, K. Lapina, P. Fialho, M.P. Dziobak, **J. Kleissl**, D.L. Westphal, 'Regional and hemispheric impacts of anthropogenic and biomass burning emissions on summertime CO and O₃ in the North Atlantic lower free troposphere,' *Journal of Geophysical Research – Atmospheres*, 109, D24310, 2005
- Park, S.S., **J. Kleissl**, D. Harrison, N.P. Nair, V. Kumar, J. Ondov, 'Investigation of PM_{2.5} Episodes Using Semi-Continuous instruments at the Baltimore Supersite,' *submitted to Journal of Aerosol Research*

Published Abstracts

- **Kleissl, J.**, C. Meneveau, and M.B. Parlange, 'A priori study of the scale-dependent dynamic model from HATS field data,' *Bulletin of the American Physical Society*, 56th Annual Meeting of the Division of Fluid Dynamics, Vol. 48, No. 10, Meadowlands, NJ, Nov 2003, p. 195

- **Kleissl, J.**, C. Meneveau, and M.B. Parlange, 'Statistical analysis of subfilter-scale model coefficients from measurements in the atmospheric surface layer,' *Bulletin of the American Physical Society*, 55th Annual Meeting of the Division of Fluid Dynamics, Vol. 47, No. 10, Dallas, TX, Nov 2002, p. 165
- **Kleissl, J.**, C. Meneveau, and M.B. Parlange, 'Effects of stability and filter size on model coefficients and intermittency of subfilter fluxes in the atmospheric boundary layer,' *AMS 15th Symposium on Boundary Layers and Turbulence*, July 2002, Wageningen, The Netherlands, pp. 467-468
- **Kleissl, J.**, C. Meneveau and M.B. Parlange, 'Field measurements for subgrid-scale modeling in the atmospheric boundary layer,' *Extended abstract CD of 3rd International Symposium on Environmental Hydraulics*, 2001, Tempe, AZ

Presentations in Conferences and Congresses

- 'Application of wireless sensor networks to study flow over heterogeneous surfaces: flow over an isolated mountain in the marine atmosphere,' Fall Meeting of the American Geophysical Union (AGU), San Francisco, CA, 2004
- 'A priori study of the scale-dependent dynamic model from HATS field data,' 56th Annual Meeting of the American Physical Society, Division of Fluid Dynamics, Meadowlands, NJ, Nov 2003
- 'Meteorological conditions during long term PM events in June – October 2002 at the Baltimore PM Supersite', Baltimore PM Supersite Data Meeting, University of Maryland at College Park, June 2003
- 'On the magnitude and variability of subgrid-scale eddy diffusion coefficients in the atmospheric boundary layer,' Spring Meeting of the American Geophysical Union (AGU) and European Geophysical Society, Nice, France, 2003
- 'Entrainment of forest fire smoke into the atmospheric boundary layer,' Gallery of Fluid Motion, 55th Meeting of the American Physical Society (APS), Division of Fluid Dynamics, Dallas, TX, 2002
- 'Statistical Analysis of subfilter-scale model coefficients from field-experimental data,' Symposium on Boundary Layers and Turbulence, American Meteorological Society (AMS), Wageningen, The Netherlands, 2002
- 'New observations on subgrid-scale modeling from field experiments,' Fall Meeting of the American Geophysical Union (AGU), San Francisco, CA, 2001
- 'Field measurements for subgrid-scale modeling in the atmospheric boundary layer,' 3rd International Symposium on Environmental Hydraulics, Tempe, AZ, 2001
- 'Applicability of Taylor's hypothesis to atmospheric boundary layer field measurements of subgrid-scale stresses,' Fall Meeting of the American Geophysical Union (AGU), San Francisco, CA, 2000

Grant Writing Experience

- 'Large-eddy-simulation studies of land-atmosphere interaction over complex terrain, using new-generation dynamic models,' supercomputer allocation with National Center for Atmospheric Research, Scientific Computing Division (NCAR-SCD), 2002. Awarded 10,000 GAUs (General Accounting Units)
- Supercomputer allocation with Albuquerque High Performance Computing Center, 2002. Awarded 10,000 SUs (Supercomputing Units)

Field Measurement Campaigns

- **Mountain Meteorology:** Azores, Summer 2004: Wireless sensors, meteorological measurements, and MODIS satellite data are collected to study upslope and down-slope flow on the slope of a mountain in the North Atlantic free troposphere.
- **Biocomplexity in the Environment:** Instrumentation to measure the emission and transport of biological aerosols (pollen) in the atmosphere, July 2003, Hurlock, MD.
- **Chile,** February 2003, Eddy correlation studies of evaporation over vineyards in collaboration with Universidad de Talca, Chile.
- **SGS2002** (SubGrid-Scale experiment), Salt Flats, UT, June 2002: Deployment of sixteen 3D-sonic anemometers to study subgrid-scale physics for large eddy simulation. Other collaborators examine turbulence at high Reynolds numbers.
- **Baltimore Supersite Study,** May 2001 – February 2003: Lidar measurements to determine atmospheric boundary layer height, interfacial dynamics at the inversion and plume characteristics. Meteorological and turbulence measurements. Collaborations with atmospheric chemists allow highly time and size resolved concentrations of urban PM_{2.5} and its constituents for source determination.
- **HATS** (Horizontal Array Turbulence Study), Kettleman City, CA, September 2000, in collaboration with NCAR-ATD and MMM: Deployment of fourteen 3D-sonic anemometers in the central valley of CA to study subgrid-scale physics for large eddy simulation.

Professional Affiliations

American Physical Society, Division of Fluid Dynamics
American Meteorological Society
American Geophysical Union, Hydrology Section
European Geophysical Society
International Association for Hydraulic Research (IAHR)
American Society of Civil Engineers

Special Skills

- **Languages:** Fluent: German, English, Spanish, French; Intermediate: Italian, Portuguese
- **Private Pilot Certificate:** working towards Commercial Pilot Certificate
- **Webpage Designer and Administrator** for Department of Geography and Environmental Engineering, The Johns Hopkins University, www.jhu.edu/dogee, 2000-2003

References

Charles Meneveau (PhD. advisor)
Professor, Dept. of Mechanical Engineering
Johns Hopkins University
3400 N. Charles St.
Baltimore, MD, 21218
meneveau@jhu.edu
Ph. (410) 516-7802
Fax (410) 516-7254

Marc B. Parlange (PhD. advisor)
Professor, Faculte de l'Environnement, Architectural et Construit - LPAS
Batiment 6R – Ecublens
Ecole Polytechnique Federal de Lausanne
CH - 1015 Lausanne
Switzerland
Marc.Parlange@epfl.ch
Ph. + 41 21 693 80 42
Fax + 41 21 693 80 40

Richard Honrath (postdoc advisor)
Professor, Dept. of Civil and Environmental Engineering
Michigan Technological University
1400 Townsend Dr.
Houghton, MI 49931-1295
reh@mtu.edu
Ph. (906) 487-3202
Fax (906) 487-2943