

Curriculum Vitae

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Education

- Jan. 2007- Nov. 2011 **PhD in Mechanical Engineering**, École Polytechnique Fédérale de Lausanne, EPFL.
PhD Advisors: Marc B. Parlange (EPFL) and C. Meneveau (JHU)
- Sept. 2007 – Sept. 2009 **PhD exchange student at The Johns Hopkins University**, JHU, Baltimore, USA.
Advisor: C. Meneveau
- Sept. 2000 – June 2006 **Degree in Physics**, University of Barcelona, UB, Spain.
- Oct. 2004 – July 2005 Erasmus exchange student at EPFL, Physics department.

Professional Experience and Internships

- Sep. 2019 – June 2020 **Humboldt Research Fellow** for Experienced Researchers; on sabbatical leave at the Institute of Meteorology and Climate Research of the Karlsruhe Institute of Technology, in Garmisch-Partenkirchen (Germany).
- July 2019 - **Associate Professor** at the Mechanical Engineering Department, University of Utah (UofU).
- Feb. 2013 – June 2019 **Assistant Professor** at the Mechanical Engineering Department, University of Utah (UofU). *At University of Utah I have developed a research group that studies fundamental turbulence in Atmospheric Boundary Layer flows together with wind and solar energy systems. For my tenure I graduated three PhD students, two at UofU, and a third one at EPFL, Switzerland. I did also graduate two Ms students at UofU. Since my arrival at UofU I have taught 4 different courses (1 at the undergraduate level and 3 at the Ms level), out of which I developed one from scratch. In terms of funding, I have submitted tens of research proposals to US funding agencies, out of which I have received funding for four Projects (NSF, DOE and State of Utah), and two more for computational resources (XSEDE, NREL). I also was recently awarded with a Humboldt Research Fellowship for Experienced Researchers.*
- Dec. 2011- Dec.2012 **Post-Doctoral Researcher, Dept. of Environmental Eng., École Polytechnique Fédérale de Lausanne, EPFL.** *During this time, I investigated land-atmosphere interactions in complex terrain using experimental measurements of wind Lidars. At the same time, I managed a Master student and several Bachelor research projects.*
- Jan. 2007- Nov. 2011 **Scientific Assistant, Dept. of Environmental Eng., École Polytechnique Fédérale de Lausanne, EPFL.** *The focus of my PhD was to create new knowledge on the interaction between the atmospheric boundary layer (ABL) and large wind farms. I developed a powerful numerical framework capable of such endeavor, as well as new physical interpretation of the occurring phenomena.*
- Sept 2007 – Sept. 2009 **Visiting Graduate Student at the Johns Hopkins University.** *I developed the numerical platform used throughout my PhD work.*
- July 2005 – Sept. 2005 **Internship at the Snow and Avalanche research institute, SLF, Davos (Switzerland).** *I collaborated on the development of a numerical code for the study of the snowpack's temporal evolution.*

Awards

- Spring 2014 Placed among the top instructors of the College of Engineering selected from student evaluations for the Introduction to Fluid Mechanics course (ME 3700).
- Fall 2018 Placed among the top instructors of the College of Engineering selected from student evaluations for the Introduction to Fluid Mechanics course (ME 3700/3710).

Research Grants

- Humboldt Research Fellowship for Experienced Researchers. Research Project: “Parametrization of the land surface roughness and thermal heterogeneities.” Budget: Monthly stipend of 3,500 Euros/month for the duration of the Fellowship. The Fellowship is for 16 months divided in three periods of ten, three and three months correspondingly.
- Collaborative Research: Unfolding the link between forest canopy structure and flow morphology: A physics-based representation for numerical weather prediction simulations (NSF – PDM). Budget: \$624,763 (out of which \$228,529 are for my research group. This grant is in collaboration with Prof. Higgins at OSU and Prof. Cal at PSU. I am the PI.)
- Collaborative Research: Parameterization of the land-surface thermal and moisture heterogeneities (NSF – Physical and Dynamic Meteorology-PDM) Budget: \$950,000 (out of which \$255,000 are for my research group. This grant is in collaboration with Prof. Pardyjak and Prof. Hultmark at Princeton. I am the co-PI on this grant. This was strategically done so I could also submit another grant into the same NSF-PDM program, see the grant above.)
- Collaborative Research: Enhanced convection for higher module and system efficiency (DOE-SETO). Budget: \$1,200,000 (out of which \$399,128 are for my research group. This grant is in collaboration with Prof. Cal at PSU, and Dr. Silverman at NREL. I am a co-PI in this grant because we agreed that having a more senior PI on this project would increase our chances of funding, given the large amount of money involved in the grant. Note that the original proposal was for \$1,600,000.)
- A new tool for studies of atmospheric aerosols (USTAR – State of Utah). Budget: \$130,547 (out of which ~ \$30,000 are for my research group. This grant is in collaboration with Prof. Anna Gannet Hallar in the Atmospheric Science Department at University of Utah.
- GCSC Fellowship for a PhD student (University of Utah). Budget: Academic year fellowship \$19,000
- NREL Fellowship for PhD student (DOE – NREL). Budget: 3 months fellowship \$3,000/month

Computing proposals:

- Large-eddy simulations of the atmospheric boundary layer in complex terrain (XSEDE). Budget: 427,000 CPU hours (equivalent to \$17,176 according to the XSEDE communication letter).
- Numerical simulations to enhance convection and boost solar PV module efficiency (NREL Supercomputer) Budget: 500,000 CPU hours.
- Large Eddy Simulations of the Atmospheric Boundary Layer and renewable energy applications (CHPC at UofU) Budget: 700,000 SU hours.

Ten Selected Publications

1. Stiperski, M. Calaf and M. Rotach. Scaling, Anisotropy, and Complexity in Near-Surface Atmospheric Turbulence. **Journal of Geophysical Research: Atmospheres**, 124, 1428-1448, **2019**.
2. E. Akeh, S. Good, M. Calaf and C. Higgins. Solar PV Power Potential is Greatest Over Croplands. **Scientific Reports-Nature**, 9:11442, 1-6, **2019**
3. F. Margairaz, M. G. Giometto, M. B. Parlange and M. Calaf. Comparison of dealiasing schemes in large-eddy simulation of neutrally-stratified atmospheric boundary-layer type flows. **Geoscientific Model Development**, 11, 4069-4084, **2018**.
4. Stiperski and M. Calaf. Dependence of near-surface similarity scaling on the anisotropy of atmospheric turbulence. **Quarterly Journal of the Royal Meteorological**, 144:641-657, **2017**.
5. T. Morrison, M. Calaf, H.J.S. Fernando, T. A. Price and E. Pardyjak. A methodology for computing

- spatially and temporally varying surface sensible heat flux from thermal imagery. **Quarterly Journal of the Royal Meteorology Society**, 143, 2616-2624, 2017.
6. V. Sharma, M.B. Parlange and M. Calaf. Perturbations to the Spatial and Temporal Characteristics of the Diurnally-Varying Atmospheric Boundary Layer Due to an Extensive Wind Farm. **Boundary Layer Meteorology**, DOI 10.1007/s10546-016-0195-0, 2016.
 7. C. W. Higgins and K. Vache and M. Calaf and E. Hassanpour and M. B. Parlange. Wind Turbines and Water in Irrigated Areas. **Agricultural Water Management**, 152, 299-300, 2015.
 8. M. Calaf, C.W. Higgins and M.B. Parlange, Large Wind Farms and the Scalar Flux over a Heterogeneously Rough Land Surface. **Boundary Layer Meteorology**, 10.1007/s10546-014-9959-6, 1-25, 2014.
 9. M. Calaf, M. Hultmark, H.J. Oldroyd, V. Simeonov and M.B. Parlange, Coherent structures and the k^{-1} spectral behavior. **Physics of Fluids**, 25:125107, 1-14, 2013.
 10. M. Hultmark, M. Calaf and M.B. Parlange, A new wall-shear stress model for atmospheric boundary layer simulations. **Journal of Atmospheric Sciences**, 70, 3460-3461, DOI: 10.1175/JAS-D-12-0257.1, 2013.

All Published Journal Publications

1. Stiperski, M. Calaf and M. Rotach. Scaling, Anisotropy, and Complexity in Near-Surface Atmospheric Turbulence. **Journal of Geophysical Research: Atmospheres**, 124, 1428-1448, 2019.
2. E. Akeh, S. Good, M. Calaf and C. Higgins. Solar PV Power Potential is Greatest Over Croplands. **Scientific Reports-Nature**, 9:11442, 1-6, 2019.
3. N. Ali, N. Hamilton, M. Calaf, R.B. Cal. Classification of the Reynolds stress anisotropy tensor in very large thermally stratified wind farms using colormap image segmentation. **Journal of Renewable and Sustainable Energy**, 063305, 1-0, 2019.
4. G. Cortina, V. Sharma, R. Torres, and M. Calaf. Mean Kinetic Energy Distribution in Finite-Size Wind Farms: a Function of Turbines' Arrangement. **Renewable Energy**, (in press), 2019.
5. N. Ali, N. Hamilton, M. Calaf, and R. B. Cal. Turbulence Kinetic Energy Budget and Conditional Sampling of Momentum, Scalar, and Intermittency Fluxes in Thermally Stratified Wind Plants. **Journal of Turbulence**, 20:1, 32-63, 2019.
6. R. Vaillon, R. B. Cal, O. Dupré and M. Calaf. Pathway for mitigating thermal losses in solar photovoltaics. **Scientific Reports-Nature**, 8:13163, 2018.
7. F. Margairaz, M. G. Giometto, M. B. Parlange and M. Calaf. Comparison of dealiasing schemes in large-eddy simulation of neutrally-stratified atmospheric boundary-layer type flows. **Geoscientific Model Development**, 11, 4069-4084, 2018.
8. V. Sharma, G. Cortina, F. Margairaz, M. B. Parlange, and M. Calaf. Evolution of flow characteristics through finite-sized wind farms and influence of turbine arrangement. **Renewable Energy**, 115, 1196-1208, 2018.
9. J. Feliciano, G. Cortina, A. Spear and M. Calaf. Generalized analytical displacement model for wind turbine towers under aerodynamic loading. **Journal of Wind Engineering and Industrial Aerodynamics**, 176, 120-130, 2018.
10. N. Hamilton, V. Biggiano, M. Tutkun, M. Calaf, R. B. Cal. A generalized framework for reduced-order modeling of a wind turbine wake. **Wind Energy**, 1-8, 2018.
11. N. Ali, N. Hamilton, G. Cortina, M. Calaf and R. B. Cal. Anisotropy invariants of thermally stratified wind turbine array boundary layers using large eddy simulations. **Journal of Renewable and Sustainable Energy**, 10:013301, 1-23, 2018.
12. Stiperski and M. Calaf. Dependence of near-surface similarity scaling on the anisotropy of atmospheric turbulence. **Quarterly Journal of the Royal Meteorological**, 144:641-657, 2017.
13. T. Morrison, M. Calaf, H.J.S. Fernando, T. A. Price and E. Pardyjak. A methodology for computing spatially and temporally varying surface sensible heat flux from thermal imagery. **Quarterly Journal of the Royal Meteorology Society**, 143, 2616-2624, 2017.
14. N. Ali, G. Cortina, N. Hamilton, M. Calaf and R. B. Cal. Turbulence characteristics of a thermally stratified wind turbine array boundary layer via Proper Orthogonal Decomposition. **Journal of Fluid Mechanics**, 828, 175-195, 2017.
15. G. Cortina, V. Sharma, M. Calaf. Wind farm density and harvested power in very large wind farms: A low-order model. **Physical Review Fluids**, 2, 074601, 1-19, 2017.
16. N. Hamilton, R. B. Cal, B. Viggiano, M. Calaf and M. Tutkun. A generalized framework for reduced-order modeling of a wind turbine wake. **Wind Energy**, 1-18, 2017.
17. G. Cortina, M. Calaf. Turbulence upstream of wind turbines: a large-eddy simulation approach to investigate the use of wind Lidars. **Renewable Energy**, 105, 354-365, 2017.
18. G. Cortina, R. B. Cal, and M. Calaf. Distribution of mean kinetic energy around an isolated wind turbine and a characteristic wind turbine of a very large wind farm. **Physical Review Fluids**, 1: 074402, 1-18, 2016.
19. G. Cortina, V. Sharma and M. Calaf. Investigation of the incoming wind vector for improved wind turbine yaw-adjustment under different atmospheric and wind farm conditions. **Renewable Energy**, 101, 376-386, 2017.

20. V. Sharma, M.B. Parlange and M. Calaf. Perturbations to the Spatial and Temporal Characteristics of the Diurnally-Varying Atmospheric Boundary Layer Due to an Extensive Wind Farm. **Boundary Layer Meteorology**, 2016. DOI 10.1007/s10546-016-0195-0.
21. V. Sharma, M. Calaf, M. Lehning and M.B. Parlange. Time-adaptive wind turbine model for an LES framework. **Wind Energy**, 19, 939-952, 2015.
22. R. Mutzner, S.V. Weijjs, P. Tarolli, M. Calaf, H.J. Oldroyd, M.B. Parlange. Controls on the diurnal streamflow cycles in two sub-basins of an alpine headwater catchment. **Water Resources Research**. 51: 3403-3418, 2015.
23. C. W. Higgins and K. Vache and M. Calaf and E. Hassanpour and M. B. Parlange. Wind Turbines and Water in Irrigated Areas. **Agricultural Water Management**, 152, 299-300, 2015.
24. M. Calaf, C.W. Higgins and M.B. Parlange, Large Wind Farms and the Scalar Flux over a Heterogeneously Rough Land Surface. **Boundary Layer Meteorology**, 10.1007/s10546-014-9959-6, 1-25, 2014.
25. M. Calaf, M. Hultmark, H.J. Oldroyd, V. Simeonov and M.B. Parlange, Coherent structures and the k^{-1} spectral behavior. **Physics of Fluids**, 25:125107, 1-14, 2013.
26. M. Hultmark, M. Calaf and M.B. Parlange, A new wall-shear stress model for atmospheric boundary layer simulations. **Journal of Atmospheric Sciences**, 70, 3460-3461, 2013. DOI: 10.1175/JAS-D-12-0257.1
27. H. Huwald, J. S. Selker, S. W. Tyler, M. Calaf, N. C. van de Giesen and M. B. Parlange, Carbon monoxide as a tracer of gas transport in snow and other natural porous media. **Geophysical Research Letters**, 39:L02504, 1-6, 2012.
28. M. Calaf, M. B. Parlange and C. Meneveau, Large Eddy Simulation study of scalar transport in fully developed wind-turbine array boundary layers. **Physics of Fluids**, 23 :126603, 1-16, 2011.
29. M. Calaf, C. Meneveau and J. Meyers. Large Eddy Simulation study of a fully developed wind-turbine array boundary layers. **Physics of Fluids**, 22:015110, 1-16, 2010.

Papers under review at the time of submitting the application

1. T. Morrison, M. Calaf, A. Perelet, C. Higgins, S. A. Drake, E. Pardyjak. The enthalpy equation and the role of horizontal transport versus vertical transport. **Boundary Layer Meteorology**, (Under Review), 2019.
2. F. Margairaz, E. Pardyjak, and M. Calaf. Surface thermal heterogeneities and the atmospheric boundary layer: the thermal heterogeneity parameter. **Boundary Layer Meteorology**, (Under Review), 2019.
3. F. Margairaz, E. Pardyjak, and M. Calaf. Surface thermal heterogeneities and the atmospheric boundary layer: the relevance of dispersive fluxes. **Boundary Layer Meteorology**, (Under Review), 2019.

Invited Talks

1. M. Calaf. Surface thermal heterogeneities, dispersive fluxes and the conundrum of unaccounted statistical spatial inhomogeneities. **Seminar at the Department of Atmospheric and Cryospheric Sciences, University of Innsbruck, 2019.**
2. Stiperski and M. Calaf. Relationship between Near-Surface Similarity and Turbulence Anisotropy. **23rd Symposium on Boundary Layers and Turbulence, 2018.**
3. M. Calaf, G. Cortina and V. Sharma. *Flow adjustment in a finite-size wind farm in a neutral ABL – an LES study.* **Windfarms 2016.**
4. M. Calaf, G. Cortina, Y. Karkera and V. Sharma. A large eddy simulation study of a wind farm throughout a realistic (CASES-99) diurnal cycle. **Seminar at the Mechanical Engineering Department, Portland State University, 2015.**
5. M. Calaf, M. Hultmark, H.J. Oldroyd, and M.B. Parlange. *Spectral Interaction of the LES subgrid-stress and coherent structures.* **EGU General Assembly 2013.**
6. M. Calaf. *Study of a Fully Developed Wind-Turbine Array Boundary Layer & current/future research.* **Seminar at the Mechanical Engineering Department, University of Utah, 2012.**
7. M. Calaf, M.B. Parlange, and C. Meneveau. *Study of a Fully Developed Wind-Turbine Array Boundary Layer.* **Seminar at the Civil and Environmental Engineering Department, Princeton University, 2011.**
8. M. Calaf, C. Meneveau, J. Meyers, and M.B. Parlange. *Large Eddy Simulation study of fully developed wind-turbine array boundary layers & applications.* **EWEA Wind Resource Assessment Technology Workshop, 2011.**

Conferences and Meetings

1. E. Pardyjak, M. Calaf, M. Hultmark, C.W. Higgins, G. Iungo, S.A. Drake, S.W. Hoch, D. Zajic, A. O. Perelet, T. J. Morrison, A. Bingham, C. Brunner, T.C. DeBell, N. Gunawardena, , Y.-C. Huang, S. Letizia, G. Mogollon, B. Najafi, Y. Pandya, M. Puccioni, C. Schwartz, D. Kumar, S. Sr, and L. Zhan. *The Idealized Planar Array experiment for Quantifying Surface heterogeneity (IPAQS) in the atmospheric surface layer.* **AGU General Assemble 2019.**

2. A.O. Perelet, M. Calaf, and E. Pardyjak. *Scintillometry and the Surface Energy Balance: Spatial and Temporal Scales for Energy Closure During IPAQS*. **AGU General Assembled 2019**.
3. T. Morrison, M. Calaf, S.A. Drake, C.W. Higgins, E. Pardyjak, A.O. Perelet. *The role of horizontal advection and vertical flux divergence on the temperature tendency equation*. **AGU General Assembled 2019**.
4. F. Margairaz, E. Pardyjak, and M. Calaf. *Surface thermal heterogeneities and the atmospheric boundary layer: a new non-dimensional parameter*. **AGU General Assembled 2019**.
5. T. Morrison, M. Calaf, E. Pardyjak, A.O. Perelet. *An Experimental Quantification of the Impact of Surface Thermal Heterogeneities on Atmospheric Boundary Layer Flows*. **AGU General Assembled 2019**.
6. S.A. Drake, E. Pardyjak, C. W. Higgins, M. Calaf, S. Wharton, T. Morrison, A.O. Perelet, G. Iungo, M. Puccioni, M.Hultmark, Y.-C. Huang, C. Brunner, F. Margairaz, J. Kelly, and H. J. Oldroyd. *Comparative assessment of TKE terms for two near-canonical sites*. **AGU General Assembled 2019**.
7. M. Calaf, T. Morrison, F. Margairaz, A. O. Perelet, C.W. Higgins, S.A. Drake, E.Pardyjak. *Surface thermal heterogeneities, dispersive fluxes and the conundrum of unaccounted statistical spatial inhomogeneities*. **European Meteorology Society, Annual Meeting, 2019**.
8. M. Calaf, I. Stiperski. *Dependence of near-surface similarity scaling on scalewise anisotropy of atmospheric boundary layer turbulence*. **EGU General Assembled 2019**.
9. I. Stiperski, M. Calaf. *On one component turbulence*. **EGU General Assembled 2019**.
10. M. Calaf, F. Margairaz, W. Anderson, E. Pardyjak. *Structure of heterogeneous thermally forced atmospheric boundary layer flows*. **AGU General Assembled 2018**.
11. E. Pardyjak, M. Calaf, M. Hultmark, C.W. Higgins, G. Iungo, D. Zajic, A. O. Perelet, T. J. Morrison, N. Gunawardena, C. Brunner, Y.-C. Huang, S.A. Drake, T.C. DeBell, C. Schwartz, B. Najafi, M. Puccioni, S. Hoch, S. Letizia, K. Kokmanian. *An overview of the Idealized Planar Array experiment for Quantifying Surface heterogeneity (IPAQS) in the atmospheric surface layer experiment*. **AGU General Assembled 2018**.
12. T.J. Morrison, S.A. Drake, T.C. DeBell, N. Gunawardena, A. O. Perelet, M. Calaf, C. W. Higgins, E. Pardyjak. *Idealized Planar Array experiment for Quantifying Surface heterogeneity (IPAQS) provides insight into the role of dispersive fluxes role on the Surface Energy Balance (SEB) closure*. **AGU General Assembly 2018**.
13. G. Iungo, B. Najafi, M. Puccioni, S. Hoch, M. Calaf, E. Pardyjak. *Detection and characterization of very-large-scale motions in the atmospheric surface layer through wind LiDAR measurements*. **AGU General Assembly 2018**.
14. F. Margairaz, M. Calaf, and E. Pardyjak. *Stepping Towards New Parameterizations for Non-Canonical Atmospheric Surface-Layer Conditions, a Dispersive-Flux Approach*. **23rd Symposium on Boundary Layers and Turbulence, 2018**.
15. M. Calaf, F. Margairaz, and E. Pardyjak. *Dispersive Fluxes and Flow Structure of Thermally Forced Atmospheric Boundary Layer Flows*. **23rd Symposium on Boundary Layers and Turbulence, 2018**.
16. I. Stiperski, M. Calaf, and M. Rotach. *Employing Anisotropy to Study Turbulence in Complex Terrain*. **23rd Symposium on Boundary Layers and Turbulence, 2018**.
17. M. Calaf, F. Margairaz, E. Pardyjak. *Stepping towards new parameterizations for non-canonical atmospheric surface-layer conditions*. **AGU General Assembly 2017**.
18. Stiperski and M. Calaf. *What can anisotropy tell us about turbulence similarity in terrain of increasing complexity?* (Invited). **AGU General Assembly 2017**.
19. T. Morrison, M. Calaf, H.J. Fernando, T. A. Price, and E. Pardyjak. *Development of a New Methodology for Computing Surface Sensible Heat Fluxes using Thermal Imagery*. **AGU General Assembly 2017**.
20. M. Calaf, V. Maurer, and N. Kalthoff. *Characteristic frequencies of boundary-layer turbulence over flat, heterogeneous terrain under different stratification conditions*. **22nd Symposium on Boundary Layers and Turbulence, 2016**.
21. F. Margairaz and M. Calaf. *Role of the dispersive fluxes in the Surface Energy Balance over heterogeneous surfaces, a LES study*. **22nd Symposium on Boundary Layers and Turbulence, 2016**.
22. G. Cortina, V. Sharma and M. Calaf. *Mean Kinetic Energy Fluxes within Wind Farms through a Diurnal Cycle*. **22nd Symposium on Boundary Layers and Turbulence, 2016**.
23. T. Morrison, M. Calaf and E. Pardyjak. *Impacts of Land Surface Heterogeneity on Atmospheric Flows during the MATERHORN Playa Field Campaign*. **22nd Symposium on Boundary Layers and Turbulence, 2016**.
24. V. Sharma, N. Ali, R.B. Cal, M.B. Parlange, M. Calaf. *Role of coherent structures in mean kinetic energy entrainment by finite-sized wind farms and lessons from canopy flows*. **22nd Symposium on Boundary Layers and Turbulence, 2016**.

25. G. Cortina, V. Sharma and M. Calaf. *Mean Kinetic Energy Fluxes within Wind Farms through a Diurnal Cycle*. **Windfarms 2016**
26. M. Calaf, G. Cortina and V. Sharma. *Wind turbine box – Energy fluxes around a characteristic wind turbine*. **68th Annual Meeting of the APS Division of Fluid Dynamics, 2015.**
27. V. Sharma, M.B. Parlange and M. Calaf. *Adjustment of mean velocity and turbulence due to a finite-size wind farm in a neutral ABL - A LES study*. **68th Annual Meeting of the APS Division of Fluid Dynamics, 2015.**
28. F. Margairaz, M. Giometto, M. B. Parlange and M. Calaf. *Study of dealiasing schemes in pseudo-spectral methods for Large-Eddy Simulations of incompressible flows*. **68th Annual Meeting of the APS Division of Fluid Dynamics, 2015.**
29. V. Sharma, M. Calaf, M.B. Parlange, and M. Lehning. *An LES study of a large wind farm during a realistic (CASES99) diurnal cycle*. **WINDFARMS 2015**, Leuven.
30. G. Cortina, V. Sharma, M. Calaf. *Turbulence analysis upstream of a wind turbine: a LES approach to improve wind LIDAR technology*. **WINDFARMS 2015**, Leuven.
31. M. Calaf, G. Cortina, Y. Dinkar, and V. Sharma. *Wind Turbine Box, the flow around a characteristic wind turbine*. **WINDFARMS 2015**, Leuven.
32. M. Calaf, V. Iungo, H. Oldroyd, M. Giometto, and M.B. Parlange. *The characteristic averaging time for the surface-layer fluxes*. **AGU General Assembly 2014.**
33. R. Mutzner, S. Weijs, P. Tarolli, M. Calaf, H. Oldroyd, and M.B. Parlange. *Controls on diurnal streamflow cycles in a high altitude catchment in the Swiss Alps*. **AGU General Assembly 2014.**
34. V. Sharma, M. Calaf, and M. B. Parlange. *LES of large wind farm during a diurnal cycle: Analysis of Energy and Scalar flux budgets*. **AGU General Assembly 2014.**
35. M. Giometto, A. Christen, M. Calaf, and M.B. Parlange. *The impact of variable building height on drag, flow and turbulence over a realistic suburban*. **AGU General Assembly 2014.**
36. M. Calaf , G. Cortina, V. Sharma, and M.B. Parlange. *Scanning of wind turbine upwind conditions: numerical algorithm and first applications*. **67th Annual Meeting of the APS Division of Fluid Dynamics, 2014.**
37. M. Calaf, G Cortina, V Sharma, and M.B. Parlange. *Scanning of wind turbine upwind conditions: numerical algorithm and first applications*. **21st Symposium on Boundary Layers and Turbulence, 2014.**
38. V. Sharma, M. Calaf, and M.B. Parlange. *LES study of a large wind farm within a diurnal ABL*. **21st Symposium on Boundary Layers and Turbulence, 2014**
39. V. Sharma, M. Calaf, and M.B. Parlange. *A Large Eddy Simulation Study for upstream wind energy conditioning*. **AGU General Assembly 2013.**
40. M. Diebold, G.G. Katul, M. Calaf, M. Lehning, and M.B. Parlange. *Separating local topography from snow effects on momentum roughness in mountain regions*. **AGU General Assembly 2013.**
41. H.J. Oldroyd, E. Paradyjak, M. Calaf, M. Giometto, H. Huwald, and M.B. Parlange. *Katabatic flow observations over a steep alpine slope*. **EGU General Assembly 2013.**
42. M. Giometto, M. Calaf, H.J. Oldroyd, J. Fang, and M.B. Parlange. *High resolution LES study of the nocturnal low level jet*. **EGU General Assembly 2013**
43. M. Calaf, M. Hultmark, H.J. Oldroyd, and M.B. Parlange. *Searching for large scale structures over Lake Geneva using Wind-Lidars*. **AGU General Assembly 2012.**
44. M. Giometto, M. Calaf, H.J. Olroyd, J. Fang, M. Putti, and M.B. Parlange. *A Lagrangian Scale-Dependent Large Eddy Simulation of Katabatic Flows*. **AGU General Assembly 2012.**
45. H.J. Oldroyd, E. Paradyjak. M. Calaf, D.F. Nadeau, M. Hultmark, and M.B. Parlange. *Steep slope flow observations during the morning transition in a narrow alpine valley*. **AGU General Assembly 2012.**
46. M. Calaf, C. Higgins, and M.B. Parlange. *Wind farms and scalar fluxes over a farmland, a Large Eddy Simulation study*. **65th Annual Meeting of the APS Division of Fluid Dynamics 2012**
47. M. Calaf, M. Hultmark, E. Trujillo, H. Oldroyd, R. Mutzner, and M.B. Parlange. *Wind Lidar measurements of sub-grid scale variability in slope flows*. **Cost Action WIRE (Weather Intelligence for Renewable Energies): Workshop on Remote Sensing Measurements for Renewable Energy, 2012.**
48. M. Calaf, M. Hultmark, and M.B. Parlange. *Towards an improved boundary condition for Large-Eddy Simulations with heterogeneous surfaces*. **EGU General Assembly 2012.**
49. M. Calaf, H.J. Oldroyd, M. Hultmark, R. Mutzner, and M.B. Parlange. *Wind Lidar measurements of sub-grid scale variability in complex terrain*. **EGU General Assembly 2012.**
50. M. Calaf, M. B. Parlange; C. Meneveau. *LES study of scalar transport in wind farms: Do wind turbine wakes increase or decrease surface fluxes?* **AGU General Assembly 2011.**

51. M. Calaf, M. B. Parlange and C. Meneveau, *Large Eddy Simulation study of scalar transport in fully developed wind-turbine array boundary layers*. **64th Annual Meeting of the APS Division of Fluid Dynamics, 2011.**
52. M. Calaf, C. Meneveau and M. B. Parlange, *Large Eddy Simulation study of fully developed thermal wind-turbine array boundary layers*. **EGU General Assembly 2011**
53. M. B. Parlange, D. F. Nadeau, E. Pardyjak, H. J. Oldroyd, M. Calaf, M. Hultmark, C. W. Higgins, and H. Huwald. *Flow during the evening transition over steep alpine slopes*. **AGU General Assembly 2011.**
54. M. Calaf, C. Meneveau and M. B. Parlange, *Large Eddy Simulation study of fully developed thermal wind-turbine array boundary layers*. **AGU General Assembly 2010.**
55. M. Calaf, C. Meneveau and M. B. Parlange, *Large Eddy Simulation study of fully developed thermal wind-turbine array boundary layers* **Direct and Large-Eddy Simulation 8, 2010.**
56. M. Calaf, C. Meneveau, J. Meyers. *Large Eddy Simulation study of fully developed wind-turbine array boundary layers*. **Euromech Colloquium 508 on Wind Turbine Wakes, 2009.**
57. M. Calaf, C. Meneveau and M. B. Parlange. *Helical vortex-based model of deterministic stresses for Large Eddy Simulation of a wind turbine wake*. **61st Annual Meeting of the APS Division of Fluid Dynamics, 2008.**
58. H. Huwald, J. S. Selker, M. Calaf, and M. B. Parlange. *Observations and Processes Near the Snow-Air Interface: Insights Gained from New and Comparative Sensor Systems in View of Snow Surface Energy Balance Closure*. **AGU General Assembly 2007.**

Book Chapters

- M. Calaf, C. Meneveau and M. Parlange, Large Eddy Simulation study of a fully developed thermal wind-turbine array boundary layer. In *Direct and Large-Eddy Simulation VIII*, 425 ERCOFTAC Series 15, 239-244, 2011. (H. Kuerten et al., eds., DOI 10.1007/978-94-007-2482-2 38).

Media

- Blog Post on the 'research spotlight' series from the Sustainability Resource Center, on campus (<http://sustainableutah.wordpress.com/>). The Blog report was about current and recent faculty, staff and student research in the field of sustainability. (April 2015)

“RESEARCH SPOTLIGHT: HERE’S WHAT’S SPINNING IN THE WIND, ENERGY, AND TURBULENCE LAB”
- Based on my collaboration with the STEM Ambassador program from Prof. Nalini Nadkarni at University of Utah, I hosted a group of REFUGE program students in my research laboratory. This event was featured by KSL. “Professor helps students to find Refuge in education” <https://www.ksl.com/?sid=45348836&nid=148&title=professor-helps-students-to-find-refuge-in-education>
- NSF; 4 Awesome Discoveries you probably didn’t hear about, Ep. 31. ([tps://youtu.be/VVJEgHdYy-g](https://youtu.be/VVJEgHdYy-g))

Teaching

- Intermediate Fluid Mechanics, Fall 2018.
- Introduction to Fluid Mechanics, Spring 2014*, Fall 2015, 2016, 2017*
- Wind Energy, Spring 2015, Spring 2017
- Computational Fluid Dynamics, Spring 2016, Spring 2018
- TFES Seminar, Fall 2016, Spring 2017, Fall 2018.

(* Dean’s recognition for teaching excellence.)

Research Project Advisor for Students

- | | | |
|--|-----|--|
| • Gerard Cortina (Graduated 2018) | PhD | Wind Energy & ABL |
| • Fabien Margairaz (Graduated 2019) | PhD | Land-Surface Heterogeneities & ABL |
| • Travis Morrison | PhD | Land-Surface Heterogeneities & ABL |
| • Brooke Stanislawski | PhD | Solar Energy Systems |
| • Giulia Salmaso | PhD | Vegetated Canopy Heterogeneities & ABL |
| • Zev Underwood | PhD | Solar Energy Systems |
| • Yohhan Karkera (Graduated 2016) | MS | Wind Energy Systems |
| • Byron Eng | Ms | Solar Energy Systems & ABL |
| • Cristopher Anjewierden | Ms | Wind Energy Systems |
| • Varun Sharma* (Graduated 2018) | PhD | Large Eddy Simulations of Wind Farms |
| • Naseem Kamil Ali** (Graduated 2018) | PhD | Large Eddy Simulations of Wind Farms |
| • Elnaz Hassanpour*** (Graduated 2018) | PhD | Renewable Energy & Atmos. Flows |

* Varun Sharma was a PhD student at EPFL. While his official advisors were Prof. Lehning at EPFL and Prof. Parlange at UBC, I played the role of main advisor, steering his research with weekly Skype meetings. In addition, since the beginning of his PhD we had intensive (month length) working periods in which either I visited him in Switzerland or he visited at University of Utah.

** Naseem Ali was a PhD student at Portland State University. He was a visiting scholar for 6 months (September 15- February 16). His research resulted in a series of journal publications.

*** Elnaz Hasanpour was a PhD student at Oregon State University, for whom I was a co-advisor. Together with her main advisor we worked on quantification and understanding of the land-atmosphere interactions in large wind and solar energy systems.

Professional Service

- Convener for a session at the EGU 2019-2021 meetings.
- Convener for a session at the AGU 2018-2020 meetings.
- Member of the organizing committee for the 22nd Symposium on Boundary Layer and Turbulence that took place in Salt Lake City in June 2016
- Session Chair at BLT 2016.
- Session Chair at WINDFARMS 2016.
- Session Chair at APS 2015.
- Session Chair at APS 2014.
- Journal Reviewer: the Bulletin of the American Meteorological Society, Quarterly Journal of the Royal Meteorological Society, Journal of Advanced Modeling Earth Sciences, Boundary Layer Meteorology, Journal of Applied Meteorology and Climatology, Journal of Atmospheric Sciences, Advanced in Water Resources, Journal of Fluid Mechanics, Physical Review Fluids, Physics of Fluids, Journal of Turbulence, Wind Energy Science Discussions, Wind Energy, Journal of Renewable and Sustainable Energy, Environmental Fluid Mechanics, etc.
- Proposal Reviewer for several funding agencies: NSF, the French National Research Agency (ANR), as well as the Flemish (Belgium) and German equivalents. In NSF, I have participated in review panels for the Fluid Dynamics program and the Physical and Dynamic Meteorology program. Finally, I have also provided support in different small funding programs within University of Utah, either for student funding or research funding (UROP, GCSC, CHPC).

Department, College and University Service

- Fall 2018 – current: Faculty Success Committee (Department Level)
- Spring 2013 – current: Distinguished Seminar Committee (Department Level)
- Fall 2015 – Sp. 2018: Graduate Committee (Department Level)
- Fall 2016 – current: Athletics Advisory Council (AAC, University Level)
- Fall 2016 – current: Allocation Committee at the Center for High Performance Computing (University Level)
- Fall 2016 – Spring 17: Seminar Series Committee for the Global Climate Change and Sustainability Center (GCSC, University Level).

Professional Organizations

- Member of the American Geophysics Union.
- Member of the American Meteorological Society.
- Member of the America Physics Society.