PING HE **Curriculum Vitae**

Assistant Professor of Aerospace Engineering
Michael and Denise Mack 2050 Challenge Scholar
Iowa State University
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Updated: February 21, 2024

EDUCATION

Ph.D. in Mechanical Engineering (Engineering Thermophysics)
Chinese Academy of Sciences, Beijing, China (2012)

B.S. in Mechanical Engineering (Thermal Energy and Power Engineering)
Sichuan University, Chengdu, China (2007)

PROFESSIONAL EXPERIENCE

Iowa State University
Assistant Professor 08/2020 – Present

University of Michigan, Ann Arbor
Assistant Research Scientist 05/2018 – 08/2020
Postdoctoral Research Fellow 06/2016 – 05/2018

North Carolina State University
Postdoctoral Research Scholar 03/2013 – 06/2016

Duke University
Visiting Scholar 09/2012 – 03/2013

Chinese Academy of Sciences
Graduate Research Assistant 09/2007 – 07/2012

RESEARCH INTERESTS

- Multidisciplinary Design Optimization
- Machine Learning & Reduced-order Modeling
- Computational Fluid Dynamics
- Aircraft and Turbomachinery Design
- Spacecraft Mission Optimization

SPONSORED PROJECTS

Five funded projects from federal agencies and the industry. Total: $1.368M. My share: $515K.

- Accelerating Scientific Discovery: A Toolset for Standardizing Data Collection and Machine Learning. The Ames National Lab, Department of Energy (DOE). Total award: $400K. 2023−2025. My role: PI. My share: $100K.
- High-fidelity Multidisciplinary Design Optimization of Heat Exchangers for eVTOL Aircraft Thermal Management. National Aeronautics and Space Administration (NASA). Total award: $100K. 2023−2024. My role: Science PI. My share: $100K.

- Collaborative Research: Enabling Large-scale Multidisciplinary Design Optimization with Unsteady Simulations: A Hybrid Pseudo-spectral Approach. National Science and Foundation (NSF). Total award: $575K. 2022−2025. My role: PI of the lead institute. My share: $250K.
- 5G Accelerated Scientific Discovery: Enabling AI at the Edge. The Ames National Lab, Department of Energy (DOE). Total award: $273K. 2021−2023. My role: co-PI. My share: $45K.
- High-fidelity MDO considering propeller-wing interaction. Hyundai Motor Company, subcontracted from University of Michigan. Total award: $20K. 2021−2022. My role: PI. My share: $20K

AWARDS

- Michael and Denise Mack 2050 Challenge Scholar, 2023–2024.
- Wu Chung-Hua Scholarship for Outstanding Students, 2012
- Excellent Student of Graduate University of Chinese Academy of Sciences, 2010
- Undergraduate Scholarship Awarded by Sichuan University, 2004–2006

OPEN-SOURCE SOFTWARE

- **`DAFoam`**: Discrete adjoint with OpenFOAM for high-fidelity multidisciplinary design optimization

  Documentation: https://dafoam.github.io
  Features: Aerodynamic, aero-thermal, aero-structural, and hydro-propulsive design optimization for aircraft, cars, ships, and turbomachinery

- **`HERCULES`**: A massively-parallel direct numerical simulation (DNS) solver for stratified turbulent flow

  Documentation: https://herculescode.rtfd.io
  Features: Petascale high-fidelity turbulence simulation for high Reynolds numbers, scaling up to $\mathcal{O}(10)$ billion cells and $\mathcal{O}(10{,}000)$ CPU cores; constructing new turbulence models using a coupled DNS and machine learning approach

TEACHING

- Aer E 463/563 Introduction to Multidisciplinary Design Optimization at Iowa State University, S2024.
- Aer E 362 Aerospace Systems Integration at Iowa State University, S2021 to F2023.
- MEA 463 Fluid Physics at North Carolina State University, F2015

STUDENT SUPERVISION

Graduate Students

- Gage Harris. PhD student. Research topic: Multidisciplinary design optimization for spacecraft mission. 08/2021−Present.
- Heyecan Koyuncuoglu. PhD student. Research topic: Wing-propeller aerodynamic optimization for urban air mobility vehicles. 05/2021−Present.
- Khanh Hoang. M.S. student. Research topic: Aerostructural optimization of high-aspect ratio wings. 05/2023−Present.

- Lean Fang. PhD student. Research topic: Large-scale multidisciplinary design optimization with for unsteady processes. 08/2021−Present.
- Seth Zoppelt. PhD student. Research topic: Aerostructural Optimization of Aircraft Propellers. 08/2023−Present.
- Sherly Hattasanjaya. M.S. student. Research topic: Data-driven Aerodynamic Optimization. 05/2023−Present.
- Usama Toman. M.S. student. Thesis: Aerostructural optimization of UAV propellers. 11/2022−08/2023.
- Zilong Li. PhD student. Research topic: Reduced-order modeling for unsteady aerodynamic analysis. 08/2021−Present.

Undergraduate Students

- Chris Psenica. Research topic: Conjugate Heat Transfer Optimization. 05/2023−Present.
- Matthew Mehrtens. Research topic: Impact of gradient accuracy on wing aerodynamic shape optimization. 08/2021−Present.
- Emma Pautler. Research topic: Coupled wing shape and planform optimization (LAUNCH-UAS project). 05/2023−08/2023.
- Benjamin Olsen. Research topic: Wind Turbine Aerodynamic Optimization. 05/2023−08/2023.
- Nick Goeckner. Research topic: Spacecraft Trajectory Optimization. 05/2023−08/2023.
- Andrew Thomas. Research topic: Building a GUI to facilitate aerodynamic shape optimization & Rocket aerodynamic optimization. 08/2020−05/2022.
- Robert Santiago. Research topic: Multipoint aerodynamic shape optimization. 05/2021−05/2023.
- Helen Hu. Research topic: Effect of mesh density on UAV propeller optimization (LAUNCH-UAS project). 05/2022−08/2022.
- Priscilla Pak. Research topic: Impact of planform variable on wing aerodynamic optimization (LAUNCH-UAS project). 05/2022−08/2022.
- Sharice Locke. Research topic: Airfoil aerodynamic optimization. 08/2021−12/2021.
- Kiet Tuong Tran. Research topic: Unsteady aerodynamic shape optimization for airfoils subject to periodic wakes. 09/2020−08/2021.
- Catherine Canfield. Research topic: Impact of gradient accuracy on airfoil aerodynamic shape optimization (LAUNCH-UAS project). 05/2021−08/2021.
- Joaquin Matticoli. Research topic: Wind turbine aerodynamic shape optimization (ISU Honors Program). 08/2020−05/2021.
- Kyle Neidermeier. Research topic: Compressor rotor aerodynamic shape optimization with transonic flow. 08/2020−05/2021.
- Tarith Samson. Research topic: Propeller-wing aerodynamic shape optimization. 08/2020−05/2021. Currently pursing M.S. with Prof. Leifur Leifsson at Purdue.
- Adam Bodenham. Research topic: Structural design optimization for a plate. 08/2020−12/2020.
- Benjamin Beaumont. Research topic: Vorticity-stream function method for cavity flow (NCSU Honors program). 08/2015−12/2015

PROFESSIONAL SERVICES

Journal Paper Reviewing

AIAA Journal
Computers & Fluids
Journal of Power and Energy
Structural & Multidisciplinary Optimization
Advances in Engineering Software
Environmental Fluid Mechanics
Physics of Fluids
Wind Energy

Proposal Reviewing

Panel reviewer for National Science and Foundation, 2021
Reviewer for the AFRL Regional Hub Network – Midwest Phase II Proposals, 2023

Seminar/Conference Services

Moderator for 16th Annual Symposium on Undergraduate Research and Creative Expression, Iowa State University, April, 2022.
Reviewer for AIAA conference papers, 2022 and 2023.

INVITED SEMINAR TALKS

- A Need-driven Multidisciplinary Optimization Framework for More Automated Engineering Design. Departmental Seminar, University of Iowa, Iowa City, IA. Oct. 2021.
- A high-fidelity gradient-based optimization framework for multidisciplinary engineering design. Intelligent and Bio-inspired Mechanics Seminar, Virtual. May, 2021.
- Multiscale modeling of optical turbulence. Departmental Seminar, North Carolina State University, Raleigh, NC. Oct. 2015.

PUBLICATIONS

Peer-reviewed Journal Papers

[J24] L. Fang, P. He. A Duality-Preserving Adjoint Method for Segregated Navier–Stokes Solvers. *Journal of Computational Physics*, 2024. doi:10.1016/j.jcp.2024.112860

[J23] G. W. Harris, P. He, O. O. Abdelkhalik. Control Co-Design Optimization of Spacecraft Trajectory and System for Interplanetary Missions. *Journal of Spacecraft and Rockets*, 2024. doi:10.2514/1.A35680

[J22] J. Wang, H. Hu, P. He, H. Hu. A Machine Learning Study to Predict Wind-Driven Water Runback Characteristics. *Physics of Fluids*, 2023. doi:10.1063/5.0167545

[J21] Z. Li, P. He. Accelerating Unsteady Aerodynamic Simulations Using Predictive Reduced-order Modeling. *Aerospace Science and Technology*, 2023. doi:10.1016/j.ast.2023.108412

[J20] H. U. Koyuncuoglu, P. He. Simultaneous wing shape and actuator parameter optimization using the adjoint method. *Aerospace Science and Technology*, 2022. doi:10.1016/j.ast.2022.107876

[J19] N. Secco, G. K. W. Kenway, P. He, C. A. Mader, J. R. R. A. Martins. Efficient mesh generation and deformation for aerodynamic shape optimization. *AIAA Journal*, 2021. doi:10.2514/1.J059491

[J18] X. Du, P. He, J. R. R. A. Martins. Rapid airfoil design optimization via neural network-based parameterization and surrogate modeling. *Aerospace Science and Technology*, 2021. doi:10.1016/j.ast.2021.106701

[J17] P. He, C. A. Mader, J. R. R. A. Martins, K. J. Maki. DAFoam: An open source adjoint framework for multidisciplinary design optimization with OpenFOAM. *AIAA Journal*, 2020. doi:10.2514/1.J058853

[J16] S. Basu, J. Osborn, P. He, A. W. DeMacro. Mesoscale modelling of optical turbulence in the atmosphere: the need for ultrahigh vertical grid resolution. *Monthly Notices of the Royal Astronomical Society*, 497, 2302-2308, 2020. doi:10.1093/mnras/staa2010

[J15] S. Basu, P. He, A. W. DeMarco. Parametrizing the Energy Dissipation Rate in Stably Stratified Flows. *Boundary-Layer Meteorology*, 2020. doi:10.1007/s10546-020-00559-0

[J14] S. Basu, A. W. DeMacro, P. He. On the dissipation rate of temperature fluctuations in stably stratified lows, *Environmental Fluid Mechanics*, 2020. doi:10.1007/s10652-020-09761-7

[J13] P. He, G. P. Filip, K. J. Maki, J. R. R. A. Martins. Design optimization for self-propulsion of a bulk carrier hull using a discrete adjoint method. *Computers & Fluids*, 2019. doi:10.1016/j.compfluid.2019.104259

[J12] G. K. W. Kenway, C. A. Mader, P. He, J. R. R. A. Martins. Effective adjoint approaches for computational fluid dynamics. *Progress in Aerospace Sciences*, 2019. doi:10.1016/j.paerosci.2019.05.002

[J11] P. He, C. A. Mader, J. R. R. A. Martins, K. J. Maki . Aerothermal optimization of a ribbed U bend cooling channel using the adjoint method. *International Journal of Heat and Mass Transfer*, 140, pp. 152-172, 2019. doi:10.1016/j.ijheatmasstransfer.2019.05.075

[J10] P. He, C. A. Mader, J. R. R. A. Martins, K. J. Maki. An aerodynamic design optimization framework using a discrete adjoint approach with OpenFOAM. *Computers & Fluids*, 168, pp. 285-303, 2018. doi:10.1016/j.compfluid.2018.04.012

[J9] P. He, S. Basu. Extending a surface-layer C_n^2 model for strongly stratified conditions utilizing a numerically-generated turbulence dataset. *Optics Express*, 24, pp. 9574-9582, 2016. doi:10.1364/OE.24.009574

[J8] P. He. A high order finite difference solver for massively parallel simulations of stably stratified turbulent channel flows. *Computers & Fluids*, 127, pp. 161-173, 2016. doi:10.1016/j.compfluid.2015.12.012

[J7] P. He, S. Basu. Development of similarity relationships for energy dissipation rate and temperature structure parameter in stably stratified flows: a direct numerical simulation approach. *Environmental Fluid Mechanics*, 16, pp. 373-399, 2015. doi:10.1007/s10652-015-9427-y

[J6] P. He, S. Basu. Direct numerical simulation of intermittent turbulence under stably stratified conditions. *Nonlinear Processes in Geophysics*, 22, pp. 447-471, 2015. doi:10.5194/npg-22-447-2015

[J5] P. He, C. G. Nunalee, S. Basu, J. Minet, M. A. Vorontsov, S. T. Fiorino. Influence of heterogeneous refractivity on optical wave propagation in coastal environments. *Meteorology and Atmospheric Physics*, 127, pp. 685-699, 2015. doi:10.1007/s00703-015-0391-3

[J4] C. G. Nunalee, P. He, S. Basu, J. Minet, M. A. Vorontsov. Mapping optical ray trajectories through

island wake vortices. *Meteorology and Atmospheric Physics*, 127, pp. 355-368, 2015. doi:10.1007/s00703-015-0366-4

[J3] P. He, Z. G. Sun, B. T. Guo, H. S. Chen, C. Q. Tan. Aerothermal investigation of backface clearance flow in deeply scalloped radial turbines. *ASME Journal of Turbomachinery*, 135, p. 021002, 2013. doi:10.1115/1.4006664

[J2] P. He, Z. G. Sun, H. L. Zhang, H. S. Chen, C. Q. Tan. Investigation of clearance flows in deeply scalloped radial turbines. *Proc. IMechE., Part A: Journal of Power and Energy*, 226, pp. 951-962, 2012. doi:10.1177/0957650912460361

[J1] P. He, Z. G. Sun, H. S. Chen, C. Q. Tan. Investigation of backface cavity sealing flow in deeply scalloped radial turbines. *Proc. IMechE., Part A: Journal of Power and Energy*, 226, pp. 751-763, 2012. doi:10.1177/0957650912452355

Conference Papers

[C30] L. Fang, P. He. A Segregated Time-Accurate Adjoint Method for Field Inversion of Unsteady Flow. AIAA SciTech forum, 2024. doi:10.2514/6.2024-0158

[C29] G. Harris, P. He. Low-Thrust Spacecraft Trajectory Optimization with Gravity-Assist Maneuver using Dymos. AIAA SciTech forum, 2024. doi:10.2514/6.2024-0633

[C28] S. Zoppelt, H. Koyuncuoglu. P. He. High-fidelity Aerostructural Optimization Benchmark for Aircraft Propellers in Hover. AIAA SciTech forum, 2024. doi:10.2514/6.2024-2773

[C27] A. Negrete, G. Harris, O. Abdelkhalik, P. He. A Suboptimal Three Body Shape Based Approach to Trajectory Design. AIAA SciTech forum, 2024. doi:10.2514/6.2024-0290

[C26] O. Bidar, P. He, S. Anderson, N. Qin. Aerodynamic Shape Optimisation Using a Machine Learning-Augmented Turbulence Model. AIAA SciTech forum, 2024. doi:10.2514/6.2024-1231

[C25] J.C. Wang, H.Y. Hu, P. He, H. Hu. A Data-Driven Approach to Study Nonlinear Dynamics of Wind-Driven Water Runback Flows Pertinent to Aircraft Icing Phenomena. In: AIAA Aviation Forum, 2023. doi:10.2514/6.2023-4365

[C24] J.C. Wang, H. Sista, H.Y. Hu, P. He, H. Hu. A Novel Deep Learning Based Approach for Particle Image Velocimetry with Global Motion Aggregation. In: AIAA Aviation Forum, 2023. doi:10.2514/6.2023-4357

[C23] B. Pacini, M. Prajapati, K. Duraisamy, J.R.R.A. Martins, P. He. Towards Mixed-Fidelity Aero-Structural-Acoustic Optimization for Urban Air Mobility Vehicle Design. In: AIAA Aviation Forum, 2023. doi:10.2514/6.2023-3905

[C22] H. U. Koyuncuoglu, P. He. CFD Based Multi-Component Aerodynamic Optimization for Wing Propeller Coupling. In: AIAA Scitech Forum, 2023. doi:10.2514/6.2023-1844

[C21] P. He, H.U. Koyuncuoglu, H. Hu, A. Dhulipalla, H.Y. Hu, H. Hu. High-fidelity Aerodynamic and Aerostructural Optimization of UAV Propellers Using the Adjoint Method. In: AIAA Scitech Forum, 2023. doi:10.2514/6.2023-0531

[C20] B. Pacini, M. Prajapati, K. Duraisamy, J.R.R.A. Martins, P. He. B Pacini M. Prajapati, K. Duraisamy, J.R.R.A. Martins, P. He. Multipoint Aerostructural Optimization for Urban Air Mobility Vehicle Design. In: AIAA Scitech Forum, 2023. doi:10.2514/6.2023-0326

[C19] B. Pacini, M. Prajapati, K. Duraisamy, J.R.R.A. Martins, P. He. Understanding Distributed Propulsion on the NASA Tiltwing Concept Vehicle with Aerodynamic Shape Optimization. In: AIAA Scitech Forum, 2023. doi:10.2514/6.2023-0143

[C18] G.W. Harris, P. He, O.O Abdelkhalik. A Coupled Spacecraft System and Trajectory Optimization Framework using GMAT and OpenMDAO. In: AAS/AIAA Astrodynamics Specialist Conference, 2022. [preprint]

[C17] H. U. Koyuncuoglu, P. He. Coupled Wing-Propeller Aerodynamic Optimization Using the Adjoint Method. In: AIAA Scitech Forum, 2022. doi:10.2514/6.2022-0015

[C16] L. Fang, P. He. A Consistent Fixed-point Discrete Adjoint Method for Segregated Navier-Stokes Solvers. In: AIAA Aviation Forum, 2022. doi:10.2514/6.2022-4000

[C15] Z. Li, P. He. Airfoil Unsteady Aerodynamic Analysis Using a Galerkin Reduced-order Modeling Approach. In: AIAA Scitech Forum, 2022. doi:10.2514/6.2022-0080

[C14] J. R. Nagawkar, L. T. Leifsson, P. He. Aerodynamic Shape Optimization Using Gradient-Enhanced Multifidelity Neural Networks. In: AIAA Scitech Forum, 2022. doi:10.2514/6.2022-2350

[C13] Kiet T. Tran, Ping He. Unsteady aerodynamic optimization of airfoils considering shape and propeller parameters. In: AIAA Aviation Forum, 2021. doi:10.2514/6.2021-3033

[C12] P. He, J. R. R. A. Martins. A hybrid time-spectral approach for aerodynamic optimization with unsteady flow. In: AIAA Scitech Forum, 2021. doi:10.2514/6.2021-0278

[C11] P. He, R. Halder, K. Fidkowski, K. J. Maki, J. R. R. A. Martins. An efficient nonlinear reduced-order modeling approach for rapid aerodynamic analysis with OpenFOAM. In: AIAA Scitech Forum, 2021. doi:10.2514/6.2021-1476

[C10] X. Du, P. He, J. R. R. A. Martins. A B-spline-based generative adversarial network model for fast interactive airfoil aerodynamic optimization. In: AIAA Scitech Forum, AIAA-2020-2128, 2020. doi:10.2514/6.2020-2128

[C9] P. He, A. J. Luder, C. A. Mader, J. R. R. A. Martins, K. J. Maki. A time-spectral adjoint approach for aerodynamic shape optimization under periodic wakes. In: AIAA Scitech Forum, AIAA-2020-2114, 2020. doi:10.2514/6.2020-2114

[C8] P. He, C. A. Mader, J. R. R. A. Martins, K. J. Maki. An Object-oriented Framework for Rapid Discrete Adjoint Development using OpenFOAM. In: AIAA Scitech Forum, AIAA-2019-1210, 2019. doi:10.2514/6.2019-1210

[C7] P. He, C. A. Mader, J. R. R. A. Martins, K. J. Maki. Aerothermal optimization of internal cooling passages using the adjoint method, In: 2018 Joint Thermophysics and Heat Transfer Conference, 2018. AIAA Aviation Forum, AIAA-2018-4080. doi:10.2514/6.2018-4080

[C6] P. He, G. Filip, J. R. R. A. Martins, K. J. Maki. Hull form hydrodynamic design using a discrete adjoint

optimization method, In: 13th International Marine Design Conference, 2018. [PDF]

[C5] P. He, S. Basu. Mesoscale modeling of optical turbulence (Cn2) utilizing a novel physically-based parameterization. In: Proceedings of SPIE, Laser Communication and Propagation through the Atmosphere and Oceans IV, 2015. doi:10.1117/12.2188227

[C4] S. Basu, P. He. Estimating refractive index structure parameter (Cn2) profiles in the atmosphere: a wavelet transform based approach. In: Proceedings of SPIE, Laser Communication and Propagation through the Atmosphere and Oceans IV, 2015. doi:10.1117/12.2188195

[C3] P. He , C. G. Nunalee, S. Basu, M. A. Vorontsov, S. T. Fiorino. Current status and challenges in optical turbulence simulations in various layers of the Earth's atmosphere. In: Proceedings of SPIE, Laser Communication and Propagation through the Atmosphere and Oceans III, 92240F, 2014. doi:10.1117/12.2063023

[C2] C. G. Nunalee, P. He, S. Basu, M. A. Vorontsov, S. T. Fiorino. Impact of large-scale atmospheric refractive structures on optical wave propagation. In: Proceedings of SPIE, Laser Communication and Propagation through the Atmosphere and Oceans III, 92240W, 2014. doi:10.1117/12.2063022

[C1] S. Basu, C. G. Nunalee, P. He, S. T. Fiorino. Reconstructing the prevailing meteorological and optical environment during the time of the Titanic disaster. In: Proceedings of SPIE, Laser Communication and Propagation through the Atmosphere and Oceans III, 92240Y, 2014. doi:10.1117/12.2063195

Conference Proceeding & Presentations

[P11] J. A. Gibbs, R. Stoll, P. He, T. Harman, G. Torkelson. The effects of horizontal heterogeneity on the dynamics of the nocturnal boundary layer across scales. In: 23rd Symposium on Boundary Layers and Turbulence, Oklahoma City, OK, Jun. 2018. [Presentation]

[P10] P. He, and S. Basu. Direct numerical simulation of global intermittent turbulence in stably stratified flows, 22nd Symposium on Boundary Layers and Turbulence, Salt Lake City, UT, Jun. 2016. [Presentation]

[P9] P. He. Multiscale modeling of optical turbulence. Departmental Seminar, North Carolina State University, Raleigh, NC, Oct. 2015.

[P8] S. Basu, P. He. Estimating optical turbulence in the atmosphere utilizing the inherent vertical scaling characteristics of temperature fields. In: Propagation through and Characterization of Distributed Volume Turbulence and Atmospheric Phenomena, Optical Society of America, Washington DC, Jul., 2015. doi:10.1364/PCDVTAP.2015.PM1C.1

[P7] S. T. Fiorino, S. Shirey, A. DeMarco, P. He, S. Basu. Capturing realistic boundary layer aerosol and turbulence effects in WRF and other numerical weather models. In: Propagation through and Characterization of Distributed Volume Turbulence and Atmospheric Phenomena, Optical Society of America, Washington DC, Jul., 2015. doi:10.1364/PCDVTAP.2015.PT3C.3

[P6] M. C. Roggemann, P. He, S. Basu. Over the horizon propagation of light-implications for beam projection and imaging through stratified, inverted temperature distributions. In: Propagation through and Characterization of Distributed Volume Turbulence and Atmospheric Phenomena, Optical Society of America, Washington DC, Jul., 2015. doi:10.1364/PCDVTAP.2015.PT3C.2

[P5] S. Basu, J. McCrae, Z. Pollock, P. He, C. G. Nunalee, S. Basu, D. Voelz, S. T. Fiorino. Comparison of atmospheric refractive index gradient variations derived from time-lapse imagery and mesoscale modeling. In: Propagation through and Characterization of Distributed Volume Turbulence and Atmospheric Phenomena, Optical Society of America, Washington DC, Jul., 2015. doi:10.1364/PCDVTAP.2015.PM1C.4

[P4] P. He. Development of novel methodologies for C_n^2 simulation and forecasting. AFOSR MURI Annual Review Meeting, Dayton, OH, Jul. 2015.

[P3] P. He. Spatio-temporal distribution of C_n^2 in the atmosphere: comparative analysis of theoretical, numerical simulation and experimental results. AFOSR MURI Annual Review Meeting, Washington DC, Jul. 2014.

[P2] S. Basu, P. He. Quantifying the dependence of temperature and refractive index structure parameters on atmospheric stability using direct and large-eddy simulations. In: Propagation Through and Characterization of Distributed Volume Turbulence, Optical Society of America, Seattle, WA, Jul. 2014. doi:0.1364/PCDVT.2014.PM2E.3

[P1] P. He, C. Nunalee, S. Basu. Influences of the turbulence parameterizations on atmospheric refractivity simulation and forecasting. In: Propagation Through and Characterization of Distributed Volume Turbulence, Optical Society of America, Washington DC, Jul., 2013. doi:10.1364/PCDVT.2013.PW4F.1