Curriculum Vitae

HAO WU

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Department of Mathematical Sciences

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Personal Information Born on Jan. 1983 in Anhui Province, P.R. China.

Education Experiences

- Ph.D. in Applied Mathematics, Tsinghua University, Jul. 2009.
    - Thesis Advisor: Prof. Shi Jin
    - Thesis Title: Fast computational methods for high frequency waves
- B.S. in Mathematics, Tsinghua University, Jul. 2004.

Research Interests

- Optimal Transport Problem
- Machine Learning
- Seismic Inverse Problem
- High Frequency Waves
- Various Interdisciplinary Problems

Academic Experiences

- Regular position
    - Associate Professor (tenured), Dec. 2016 - , Department of Mathematical Sciences, Tsinghua University.
    - Associate Professor (tenure track), Dec. 2013 - Nov. 2016, Department of Mathematical Sciences, Tsinghua University.
    - Assistant Professor, Jun. 2011 - Nov. 2013, Department of Mathematical Sciences, Tsinghua University.
    - Research Associate, Jul. 2009 - May. 2011, Department of Mathematical Sciences, Tsinghua University.
- Visiting positions
    - Visiting fellow of the program ⟨Partial Differential Equations in Kinetic Theories⟩, Isaac Newton Institute for Mathematical Sciences, University of Cambridge, UK, Sep. 2010 and Dec. 2010.

- Postdoctoral fellow(Supervisor: Prof. Naoufel Ben Abdallah), Institute of Mathematics, University of Paul Sabatier(Toulouse III), France, Nov. 2009 – Oct. 2010.
- Visiting student, Mathematics Department, University of Wisconsin-Madison, USA, Sep. 2007 – Aug. 2008.
- Visiting student, Wolfgang Pauli Institute, University of Vienna, Austria, Feb. 2007 – Mar. 2007.

Services

- Assistant Dean, Department of Mathematical Sciences, Tsinghua University, Sep. 2017 -
- Vice Director, Institute of Computational Math and Operation Research, Department of Mathematical Sciences, Tsinghua University, Jan. 2019 -
- Member of Education Committee of China Society for Industrial and Applied Mathematics, Dec. 2016 -
- Deputy secretary general, Youth Earth Scientists Chinese National Commission, Jun. 2019 -

Editorial Boards:

- Invited Column Editor, Mathematica Numerica Sinica, Dec. 2018 -

Awards

- Academic

  [1] The most concerned academic paper in Beijing, Beijing Association for Science and Technology, 2019.
  [2] Award of nomination for Excellent Doctoral Dissertation of China, Academic Degrees Committee of the State Council, 2012.
  [3] Excellent Youth Paper Award, Chinese Society for Computational Mathematics, 2011.
  [4] Excellent Doctoral Dissertation and Outstanding Ph.D. Graduation Award, Tsinghua University, 2009.

- Teaching and Service

  [4] Excellent Youth-Teaching Award, Tsinghua University, 2017.
  [5] Outstanding award of Class tutor, Tsinghua University, 2015.
  [6] Meritorious award of Class tutor, Tsinghua University, 2013.
  [7] Outstanding award for Youth-Teaching Contest of Universities in Beijing, Educational Committee of Beijing, 2013.
  [8] Outstanding award for Youth-Teaching Contest of Tsinghua University, Tsinghua University, 2013.

Research Grants

- Current Grants

[1] PI, NSFC Project 11871297, *On the mathematical theory and fast algorithm in waveform based earthquake location* (RMB 540,000), 2019-2022.

[2] PI, Tsinghua University Initiative Scientific Research Program, *Unbalanced optimal transport: theory and application* (RMB 2,160,000), 2019-2021.

[3] Participator, NSFC Project U1839206, *The 3D fine velocity structure of North-South seismic zone and fast earthquake location method* (RMB 2,270,000), 2019-2022.

[4] Participator, National Key Research and Development Program 2017YFC1500301, *The full waveform inversion for the 3D lithosphere and upper mantle structure in Sichuan-Yunnan region* (RMB 3,080,000), 2018-2021.

- Past Grants

[5] PI, NSFC Project 11101236, *Efficient and accurate schemes for Schrödinger equation with discontinuous potential* (RMB 220,000), 2012-2014.

[6] PI, SRF for ROCS-SEM, *Efficient numerical methods for Schrödinger equation with singular potential* (RMB 30,000), 2013-2015.

[7] Participator, NSFC Project 41390452, *Math-physics models for the unconventional oil/gas reservoirs and their solutions* (RMB 2,800,000), 2014-2018.

[8] Participator, NSFC Project 91330203, *Computational Methods for Multi-scale, Multi-physics Transport Problems in Hyperbolic Vehicles* (RMB 3,500,000), 2014-2017.

[9] Participator, NSFC Project 41230210, *The full waveform inversion for lithosphere structure and its applications* (RMB 3,000,000), 2013-2017.

[10] Participator, NSFC Project 11071139, *Coupling methods for multiscale problems based on eigenfunction expansion* (RMB 250,000), 2011-2013.

[11] Participator, NSFC Project 10971115, *Numerical simulation of waves in periodic structures* (RMB 230,000), 2010-2012.

[12] Participator, NSAF Project 10676017, *Study of the Euler numerical methods for large deformation multi-phase flow with high temperature and high density* (RMB 220,000), 2007-2009.

Former Students

[1] Dr. Xijun He, Ph.D. in Jul. 2015, co-advisor. First job after graduation: China Aerospace Science and Industry Group.

[2] Ms. Zhongjun Wu, Msc Degree in Jul. 2015 (Outstanding Master Graduation Award in Beijing). First job after graduation: The People's Bank of China, Kunming Central Sub-branch.

Current Students

[1] Mr. Jing Chen, Ph.D. student since Sep. 2016.

[2] Ms. Yijia Tang, Ph.D. student (SJTU) since Sep. 2016, co-advisor.

[3] Mr. Guoxu Chen, Ph.D. student since Sep. 2018.

[4] Mr. Zhengyang Li, Ph.D. student since Sep. 2018.

[5] Mr. Baojia Luo, Ph.D. student since Sep. 2019.

[6] Ms. Wanyi Zheng, Master student since Sep. 2017.

Research Activities

- Conference speeches and posters

  [1] *The International Congress on Industrial and Applied Mathematics (ICIAM 2019) Mini-symposium on "Optimal Transport for Nonlinear Problems" and "Recent Advances on Numerical Methods and Theoretical Analysis of Complex Fluids"*, Valencia, Spain, Jul. 15-19, 2019. **(invited talk)**

  [2] *The 11th Conference on Inverse Problem, Imaging and Applications Mini-symposium on "The theory and applications of inverse scattering problems"*, Lan Zhou, Gansu, Jun. 22-24, 2019. **(invited talk)**

  [3] *Young Researcher Workshop on Uncertainty Quantification and Machine Learning*, Shanghai Jiao Tong University, Jun. 5-6, 2019. **(invited talk)**

  [4] *The 4th Workshop of Numerical Methods and Applications*, Xiamen Hotel, Xiamen, Fujian, China, Nov. 2-4, 2018. **(contributed talk)**

  [5] *The 2018 semi-annual meeting of National Key Research and Development Program "The underground Velocity structure model, the Deformation characteristics and Seismogenic zone of Sichuan-Yunnan region"*, China University of Geosciences, Wuhan, China, Oct. 27-29, 2018. **(invited talk)**

  [6] *The 2018 Annual meeting of Chinese Geoscience Union Mini-symposium on "Topic 42. Seismic wave propagation and imaging"*, Beijing International Convention Center, Oct 21-24, 2018. **(contributed talk)**

  [7] *Scientific Computing Forum*, The Institute of Computational Mathematics and Scientific/Engineering Computing of Chinese Academy of Sciences, Beijing, China, Sep. 28-29, 2018. **(invited talk)**

  [8] *The 16th Biennially Conference of CSIAM Mini-symposium on "TM01. Computational Geophysics" and "TMA14. Mathematical theory and Numerical methods in Materials Science"*, Chengdu, Sichuan, China, Sep. 13-16, 2018. **(invited talk)**

  [9] *The 9th International Conference on Partial Differential Equations & Numerical Analysis*, Hunan Normal University, Changsha, Hunan, Sep. 9-12, 2018. **(invited talk)**

  [10] *Forum on Applied and Computational Mathematics*, Beijing Computational Science Research Center, Beijing, China, Jul. 22-23, 2018. **(invited talk)**

  [11] *Workshop on Frontiers in Numerical Methods and Theorities*, Sichuan University, Chengdu, Sichuan, China, Jun. 8-11, 2018. **(invited talk)**

  [12] *The 2017 Annual meeting of Chinese Geoscience Union Mini-symposium on "Topic 50. Seismic wave propagation and imaging"*, Beijing International Convention Center, Oct 15-18, 2017. **(contributed talk)**

  [13] *CSRC Summer School on Applied Inverse Problems*, Beijing Computational Science Research Center (CSRC), Beijing, China, Aug. 7-11, 2017. **(invited talk)**

[14] *The 2017 annual meeting of NSFC key project "Computational Methods for Multi-scale, Multi-physics Transport Problems in Hyperbolic Vehicles"*, Shanghai Jiao Tong University, Shanghai, China, May 20, 2017. **(invited talk)**

[15] *Workshop on Recent Advances in Scientific and Engineering Computation*, Shanghai Jiao Tong University, Shanghai, China, May 4-7, 2017. **(invited talk)**

[16] *The 10th International Conference on Computational Physics Mini-symposium on "C4. Numerical Methods of Nonlinear Problems"*, Macao SAR, Jan. 16-20, 2017. **(invited talk)**

[17] *The 2016 Annual meeting of Chinese Geoscience Union Mini-symposium on "Topic 46. Seismic wave propagation and imaging"*, Beijing International Convention Center, Oct. 14-18, 2016. **(invited talk)**

[18] *2016 Workshop of Beijing-Tianjin-Hebei Society for Computational Mathematics*, Tianjing, China, Sep. 1-3, 2016. **(invited talk)**

[19] *The Fourth International Conference Nonlinear Waves - Theory and Applications Mini-symposium on "MS3: Analysis, Modeling, and Numerical Methods for High Frequency Waves"*, Beijing, China, Jun. 25-28, 2016. **(invited talk)**

[20] *Workshop on Frontiers in Computational and Applied Mathematics*, Tsinghua University, Beijing, China, Nov. 21-22, 2015. **(invited talk)**

[21] *The 9th International Conference on Computational Physics Mini-symposium on "A1. Numerical Methods for Kinetic Equations" and "A2. Numerical Simulation of Quantum and Kinetic Problems"*, National University of Singapore, Singapore, Jan. 7-11, 2015. **(invited talk)**

[22] *Workshop on Mathematical and Numerical Methods for Quantum, Kinetic and Non-local Problems*, Beijing Computational Science Research Center, Beijing, China, May 22-24, 2014. **(invited talk)**

[23] *The 12th Quadrennial meeting of Chinese University Society for Computational Mathematics*, National University of Defense Technology, Changsha, Hunan, China, Oct. 19-23, 2013. **(contributed talk)**

[24] *2013 Workshop of Beijing Society for Computational Mathematics*, Beijing, China, Sep. 6, 2013. **(contributed talk)**

[25] *2012 Workshop of Beijing Society for Computational Mathematics*, Weihai, Shandong, China, Jul. 6-8, 2012. **(invited talk)**

[26] *SIAM Conference on Nonlinear Waves and Coherent Structures Mini-symposium on "Computational High Frequency Waves"*, Seattle, USA, Jun. 13-16, 2012. **(invited talk)**

[27] *International Conference in Applied Mathematics*, Shanghai Jiao Tong University, Shanghai, China, Apr. 16-22, 2012. **(invited talk)**

[28] *The 9th Quadrennial meeting of Chinese Society for Computational Mathematics*, Zhengzhou, China, Sep. 19-22, 2011. **(contributed talk)**

[29] *The fifth Workshop of Young Chinese Computational Mathematicians*, Shanghai Jiao Tong University, Shanghai, China, Aug. 13-14, 2011. **(invited talk)**

[30] *2011 International Conference on Applied Mathematics and Interdisciplinary Research*, Nankai University, Tianjin, China, Jun 13-16, 2011. **(contributed talk)**

[31] *Kinetic Models of Classical and Quantum Particle Systems: a Conference in the Memory of Naoufel Ben Abdallah*, Toulouse, France, Mar. 14-18, 2011. **(invited talk)**

[32] *International Congress of Chinese Mathematicians*, Tsinghua University, China, Dec. 17-22, 2010. **(contributed talk)**

[33] *PDE Models for Quantum Fluids*, Isaac Newton Institute for Mathematical Sciences, University of Cambridge, UK, Dec. 13-17, 2010. **(invited talk)**

[34] *ESF Research Conferences - Highly Oscillatory Problems: From Theory to Applications*, Isaac Newton Institute, University of Cambridge, UK, Sep. 12-17, 2010. **(contributed talk)**

[35] *2010 Frontiers of computational and applied mathematics*, Suzhou University, China, Jul. 31 - Aug. 1, 2010. **(invited talk)**

[36] *DEASE QUATRAIN meeting: PDEs for Engineering NanoScience and Biology*, Hotel Le Royal Hammamet, Tunisia, May 17-21, 2010. **(invited talk)**

[37] *IP 2010 - MathNanoSci Intensive Programme*, University of L'Aquila, Italy, May 3-21, 2010. **(ten hours mini course)**

[38] *Workshop on Frontiers of Computational and Applied Mathematics*, Tsinghua University, China Aug. 9-10, 2009. **(invited talk)**

[39] *Workshop on Computational Methods for Quantum, High Frequency and Seismic Waves*, Tsinghua University, China, Dec. 20-21, 2008.**(invited talk)**

[40] *12th International Conference on Hyperbolic Problems: Theory, Numerics, Applications*, University of Maryland, College Park, USA, Jun. 9-13, 2008.**(contributed talk)**

[41] *Workshop on Multiscale Modeling, Analysis, and Simulations*, Michigan State Univ., East Lansing, USA, Mar. 27-28, 2008.**(presenting poster)**

- Conference Organized:

[1] *The Youth Forum in the 17th Annual Meeting of CSIAM*, Foshan, Guangzhou, China, Sep. 19-22, 2019.

[2] *Mathematical Theory and Methods in Communications*, Tsinghua University, Beijing, China, Jun 29, 2019. (Department Affairs)

[3] *Workshop on Optimal Transport and Applications*, Capital Normal University, Beijing, China, Jun. 6-8, 2019.

[4] *Tsinghua Youth Forum on Applied Mathematics*, Tsinghua University, Beijing, China, May 11-12, 2019. (Department Affairs)

[5] *Workshop of CSIAM Student Branch, Tsinghua University Subbranch*, Tsinghua University, Beijing, China, Dec. 15, 2018. (Mentor)

[6] *Computing approaches in imaging sciences*, Tsinghua University, Beijing, China, Dec. 1-2, 2018.

[7] *Tsinghua Forum on Mathematics and Financial Economics*, Tsinghua University, Beijing, China, Nov. 25, 2018. (Department Affairs)

[8] *The Youth Forum in the 16th Annual Meeting of CSIAM*, Chengdu, Sichuan, China, Sep. 13-16, 2018.

[9] *Recent and Future Developments in Exploration of Deep Internal Structure of the Earth*, Guanfang Hotel, Mengzi, Honghe, Yunnan, China, Aug. 17-20, 2018.

[10] *The 6th Workshop on Tectonics and Geophysics in the east part of Tibetan Plateau & The 2018 Annual meeting of China Continental dynamics Committee of Chinese Geophysical Society & The 2018 Annual meeting of Solid Geophysics Committee of Chinese Geophysical Society*, Guanfang Hotel, Mengzi, Honghe, Yunnan, China, Aug. 15-19, 2018.

[11] *Tsinghua Youth Forum on Pure Mathematics*, Tsinghua University, Beijing, China, Apr. 13-16, 2018. (Department Affairs)

[12] *Mathematical Model and Computation of Nonlinear Problems*, Tsinghua Sanya International Mathematics Forum, Sanya, Hainan, Jan. 15-19, 2018.

[13] *Tsinghua Forum on Mathematics Education for High School and University*, Tsinghua University, Beijing, China, Dec. 9, 2017. (Department Affairs)

[14] *The 2017 annual meeting of NSFC key project "Math-physics models for the unconventional oil/gas reservoirs and their solutions"*, Tsinghua University, Beijing, China, Dec. 15-17, 2017 .

[15] *The Youth Forum in the 15th Annual Meeting of CSIAM*, Qingdao, Shandong, China, Oct. 12-15, 2017.

[16] *Recent Developments in Seismic Wave Propagation, Imaging and the Continental Dynamics*, Yilong Binhai Hotel, Dali, Yunnan, China, Jul. 6-10, 2017.

[17] *The 2016 annual meeting of NSFC key project "Computational Methods for Multiscale, Multi-physics Transport Problems in Hyperbolic Vehicles"*, Tsinghua University, Beijing, China, Jun. 3-4, 2016.

[18] *The 2015 annual meeting of NSFC key project "The full waveform inversion for lithosphere structure and its applications"*, Tsinghua University, Beijing, China, Dec. 18, 2015.

[19] *The 2015 annual meeting of NSFC key project "Computational Methods for Multiscale, Multi-physics Transport Problems in Hyperbolic Vehicles"*, Tsinghua University, Beijing, China, Jul. 10, 2015.

[20] *The 8th International Conference on Computational Physics Mini-symposium on "Computational high frequency waves and related problems"*, Hong Kong, Jan. 7-11, 2013.

[21] *The 12th Biennially Conference of CSIAM Mini-symposium on "Multiscale computational methods in quantum mechanics and high frequency waves"*, USTC, Heifei, China, Aug. 19-24, 2012.

- Invited colloquia and seminar talks
    [1] Wolfgang Pauli Institute, Vienna, Jul. 2019.
    [2] School of Mathematics Sciences, Peking University, Dec. 2018.
    [3] School of Mathematics Sciences, Capital Normal University, Nov. 2018.
    [4] The Institute of Computational Mathematics and Scientific/Engineering Computing of Chinese Academy of Sciences, Jun. 2018.
    [5] Laboratory of Computation Physics, Institute of Applied Physics and Computational Mathematics, Jun. 2018.

[6] The Institute of Computational Mathematics and Scientific/Engineering Computing of Chinese Academy of Sciences, Jun. 2017.

[7] Yau Mathematical Sciences Center, Tsinghua University, May 2017.

[8] School of Mathematical Sciences, Peking University, Apr. 2017.

[9] Beijing Computational Science Research Center, Jul. 2015.

[10] The Institute of Computational Mathematics and Scientific/Engineering Computing of Chinese Academy of Sciences, May 2015.

[11] Department of Automation, Tsinghua University, Jun. 2013.

[12] Department of Mathematics and Computer Science, Freie Universität Berlin, Dec. 2008.

- Conference Attended

  [1] *The 5th Workshop of Numerical Methods and Applications*, Chengdu, Sichuan, China, Nov. 1-4, 2019.

  [2] *The 8th International Congress of Chinese Mathematicians*, Beijing, China, Jun 9-14, 2019.

  [3] *2018 Workshop of Beijing-Tianjin-Hebei Society for Computational Mathematics*, Hengshui, Hebei, China, Aug. 24-28, 2018.

  [4] *International Conference on Applied Math and Computational Neuroscience in Memory of David Cai*, Shanghai Jiao Tong University (SJTU), Shanghai, China, Jul. 23-27, 2018.

  [5] *Modeling and Simulation of Interface-related Problems*, Institute for Mathematical Sciences, National University of Singapore, Apr. 30 - May 3, 2018.

  [6] *The 2018 annual meeting of National Key Research and Development Program "The underground Velocity structure model, the Deformation characteristics and Seismogenic zone of Sichuan-Yunnan region"*, University of Chinese Academy of Sciences, Beijing, China, Mar. 17-18, 2018.

  [7] *Workshop on Seismology*, Baiyin, Gansu, China, Sep. 22-25, 2017.

  [8] *Workshop on Numerical Partial Differential Equations and Scientific Computing — On the occasion of Prof. Houde Han's 80th Birthday*, Tsinghua University, Beijing, China, May 27-28, 2017.

  [9] *The Seventh International Congress of Chinese Mathematicians*, Beijing, China, Aug. 7-11, 2016.

  [10] *Computational Seismology*, Tsinghua Sanya International Mathematics Forum, Sanya, Hainan, Jan. 4-8, 2016.

  [11] *2015 Workshop of Beijing Society for Computational Mathematics*, Beijing, China, Jul. 30-31, 2015.

  [12] *8th International Congress on Industrial and Applied Mathematics*, Beijing, China, Aug. 10-14, 2015.

  [13] *2008 AMS Spring Central Section Meeting*, Bloomington, IN, Apr. 5-6, 2008.

  [14] *2007-2008 Program on Random Media, Interface Problems Workshop*, Radisson Hotel in Research Triangle Park, NC, Nov. 15-16, 2007.

[15] *2007 AMS Fall Central Section Meeting*, Chicago, IL, Oct. 5-6, 2007.

[16] *Workshop on Computational High Frequency Waves*, Wolfgang Pauli Institute, Univ. of Vienna, Austria, Feb. 21-23, 2007.

[17] *2006 International Conference on Applied Mathematics and Interdisciplinary Research*, Univ. Nankai, Tianjin, China, Jun. 12-15, 2006.

Publications

[1] S. Jin, H. Wu and Z.Y. Huang, *A Hybrid Phase-Flow Method for Hamiltonian Systems with Discontinuous Hamiltonians*, SIAM Journal on Scientific Computing, 31(2008), no. 2, pp. 1303-1321.

[2] S. Jin, H. Wu and X. Yang, *Gaussian Beam Methods for the Schrödinger Equation in the Semi-classical Regime: Lagrangian and Eulerian Formulations*, Communications in Mathematical Sciences, 6(2008), no. 4, pp. 995-1020.

[3] S. Jin, H. Wu and X. Yang, *A numerical study of Gaussian beam methods for the Schrödinger-Poisson equations*, Journal of Computational Mathematics, 28(2010), no. 2, pp. 261-272.

[4] S. Jin, H. Wu, X. Yang and Z.Y. Huang, *Bloch Decomposition-Based Gaussian Beam Method for the Schrödinger equation with Periodic Potentials*, Journal of Computational Physics, 229(2010), no. 13, pp. 4869-4883.

[5] S. Jin, H. Wu and X. Yang, *Semi-Eulerian and High Order Gaussian Beam Methods for the Schrödinger Equation in the Semiclassical Regime*, Communications in Computational Physics, 9(2011), no. 3, pp. 668-687.

[6] H. Wu and X. Yang, *A Hybrid Phase-Flow Method for solving the Liouville Equation in Bounded Domain*, SIAM Journal on Numerical Analysis, 49(2011), no. 2, pp. 733-754.

[7] N. Ben Abdallah and H. Wu, *A generalized stationary algorithm for resonant tunneling: multi-mode approximation and high dimension*, Communications in Computational Physics, 10(2011), no. 4, pp. 882-898.

[8] H. Wu, *High order scheme for Schrödinger equation with discontinuous potential I: immersed interface method*, Numerical Mathematics: Theory, Methods and Applications, 4(2011), no. 4, pp. 576-597.

[9] H. Wu, Z.Y. Huang, S. Jin and D.S. Yin, *Gaussian beam methods for the Dirac equation in the Semi-classical Regime*, Communications in Mathematical Sciences, 10(2012), no. 4, pp. 1301-1315.

[10] H. Wu and X. Yang, *Eulerian Gaussian beam method for high frequency wave propagation in the reduced momentum space*, Wave Motion, 50(2013), no. 6, pp. 1036-1049.

[11] X.J. He, D.H. Yang and H. Wu, *Numerical dispersion and wave-field simulation of the Runge-Kutta discontinuous Galerkin method*, Chinese Journal of Geophysics-Chinese Edition, 57(2014), no. 3, pp. 906-917.

[12] X.J. He, D.H. Yang and H. Wu, *A weighted Runge-Kutta discontinuous Galerkin method for wavefield modelling*, Geophysical Journal International, 200(2015), no. 3, pp. 1389-1410.

[13] J.T. Huang, H. Wu and W.A. Yong, *On Initial Conditions for the Lattice Boltzmann Method*, Communications in Computational Physics, 18(2015), no. 2, pp. 450-468.

[14] H. Jing, D.H. Yang and H. Wu, *Dynamic inversion method based on the time-staggered stereo-modeling scheme and its acceleration*, Geophysical Journal International, 207(2016), no. 3, pp. 1675-1687.

[15] J.S. Li, D.H. Yang, H. Wu and X. Ma, *A low-dispersive method using the high-order stereo-modeling operator for solving wave equations*, Geophysical Journal International, 210(2017), no. 3, pp. 1938-1964.

[16] H. Wu, J. Chen, X.Y. Huang and D.H. Yang, *A new earthquake location method based on the waveform inversion*, Communications in Computational Physics, 23(2018), no. 1, pp. 118-141.

[17] J. Chen, Y.F. Chen, H. Wu and D.H. Yang, *The quadratic Wasserstein metric for Earthquake Location*, Journal of Computational Physics, 373(2018), pp. 188-209.

[18] J. Wang, D.H. Yang, H. Jing and H. Wu, *Full waveform inversion based on the Ensemble Kalman filter method using uniform sampling without replacement*, Science Bulletin, 64(2019), pp. 321-330.

[19] J. Chen, H. Jing, P. Tong, H. Wu and D.H. Yang, *The auxiliary function method for waveform based earthquake location*, arXiv:1706.05551, 2017.

[20] D.T. Zhou, J. Chen, H. Wu, D.H. Yang and L.Y. Qiu, *The Wasserstein-Fisher-Rao Metric for Waveform Based Earthquake Location*, arXiv:1812.00304, 2018.

[21] Z.H. Wang, D.T. Zhou, Y. Zhang, H. Wu and C.L. Bao, *Wasserstein-Fisher-Rao Document Distance*, arXiv:1904.10294, 2019.

Teaching

- Academic Year 2019-2020 (160 hours in total)

  [1] Methods of Mathematical physics (64 hours), Fall 2019.

  [2] Functions of Complex Variables and Equations of Mathematical Physics (48 hours + 48 hours), Fall 2019.

- Academic Year 2018-2019 (160 hours in total)

  [1] Methods of Mathematical physics (64 hours), Fall 2018.

  [2] Functions of Complex Variables and Equations of Mathematical Physics (48 hours + 48 hours), Fall 2018.

- Academic Year 2017-2018 (160 hours in total)

  [1] Numerical Solutions for Partial Differential Equations (64 hours), Spring 2018.

  [2] Functions of Complex Variables and Equations of Mathematical Physics (48 hours + 48 hours), Fall 2017.

- Academic Year 2016-2017 (160 hours in total)

  [1] Numerical Solutions for Partial Differential Equations (64 hours), Spring 2017.

  [2] Functions of Complex Variables and Equations of Mathematical Physics (48 hours + 48 hours), Fall 2016.

- Academic Year 2015-2016 (192 hours in total)

  [1] Introduction of Scientific Computing with Matlab (32 hours), Summer 2016.
  [2] Numerical Solutions for Partial Differential Equations (64 hours), Spring 2016.
  [3] Functions of Complex Variables and Equations of Mathematical Physics (48 hours + 48 hours), Fall 2015.

- Academic Year 2014-2015 (208 hours in total)

  [1] Computing Practice (48 hours), Summer 2015.
  [2] Numerical Solutions for Partial Differential Equations (64 hours), Spring 2015.
  [3] Functions of Complex Variables and Equations of Mathematical Physics (48 hours + 48 hours), Fall 2014.

- Academic Year 2013-2014 (160 hours in total)

  [1] Computing Practice (48 hours), Summer 2014.
  [2] Numerical Solutions for Partial Differential Equations (64 hours), Spring 2014.
  [3] Functions of Complex Variables and Equations of Mathematical Physics (48 hours), Fall 2013.

- Academic Year 2012-2013 (144 hours in total)

  [1] Computing Practice (48 hours), Summer 2013.
  [2] Stochastic Mathematical Methods (48 hours), Spring 2013.
  [3] Stochastic Mathematical Methods (48 hours), Fall 2012.

- Academic Year 2011-2012 (144 hours in total)

  [1] Computing Practice (48 hours), Summer 2012.
  [2] Stochastic Mathematical Methods (48 hours), Spring 2012.
  [3] Stochastic Mathematical Methods (48 hours), Fall 2011.