Bingbing Sun

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Education and Work Experience

2019.4-now   King Abdullah University of Science and Technology, Research Scientist

2016.7 – 2019.4   King Abdullah University of Science and Technology, Postdoctoral Fellow

2012.6-- 2015.6   Beijing Research Center, EXPERC ARC, Saudi Aramco, Geophysicist II

2007.9 -- 2012.6   Department of Mechanics, School of Aerospace, Tsinghua Univeristy(TU),
          for **Phd (**thesis tiled: wavefield modeling using curvelet and migration velocity analysis by adjoint state method**)   Supervisor**: Prof. Huizhu Yang

2009.10 -- 2010.10   Equipe de Geophysique ,Centre de Geosciences, Ecole des Mines de Paris,
          one year visit supported by China scholarship project.

2003.9 --2007.7   Department of Mechanics, School of Science, China University of Mining and Technology(CUMT),   **B.D.**

School Record

undergraduate study in CUMT   RANK   (**1**/60)

graduate study   in TU   RANK   (**5**/90)

Scholarships & Awards

Top-class scholarship of CUMT（2005，2006，2007）

Second class award of the advanced math competition in Jiangsu providence（2004）

Second class award of the mechanical experimental competition in Jiangsu providence（2004）

Second class scholarship of TU (2009)

Third class scholarship of TU(2007)

Top 25 presentation in SEG annual meeting (2019)

Professional Activities

Session chair: Full Waveform Inversion section (poster), 81st EAGE Conference.

Current Research

Full Waveform Inversion and machine learning.

Personal Statements

- hybrid industry and academic research experience
- good mathematical problem-solving skills.
- strong background on mechanics, geophysics.
- in depth understanding of seismic migration and inversion problem.

US Patent

[1]   A method for using a neural network to formulate an optimization problem. KAUST, Application No. 62/945,488, first author, with Prof. Tariq Alkhalifah, applying.

[2]   A method for a robust full waveform inversion. KAUST, Application No. 62/648,569, first author, with Prof. Tariq Alkhalifah. applying.

[3]   Compressing seismic wavefields in three-dimensional reverse time migration. Saudi Aramco, Application No. 62/484,101, first author, applying.

Presentations

B. Sun, 2019, ML-desent: an optimization algorithm for FWI using machine learning. SEG annual meeting. (Awarded top 25 presentation)

B. Sun, 2019, Adaptive traveltime inversion with information entropy regularization. SEG annual meeting.

B. Sun, 2019, Stereo optimal transport of the matching filter. 89th SEG annual meeting. SEG annual meeting.

B. Sun , 2019, Salt body inversion using an optimal transport of the preconditioned matching filter: EAGE annual meeting.

B. Sun ,2018, Application of optimal transport to a preconditioned data matching function for robust waveform inversion: SEG annual meeting.

B. Sun 2018, Mitigate Cycle Skipping in FWI: a Generalized Instantaneous Travel-time Approach: EAGE annual meeting.

B. Sun, 2017, High frequency Full Waveform Inversion with TV-regularization: 3rd middle east FWI workshop in Bahrain.

B. Sun, 2017, Wavefield Separation by Energy Norm Born Scattering: SEG annual meeting.

B. Sun, 2017, Automatic wave equation migration velocity analysis by focusing subsurface offset virtual sources. EAGE annual meeting

Papers and abstracts

- B. Sun, T. Alkhalifah, 2019, Joint minimization of the mean and information entropy of the matching filter distribution for a robust misfit function in full-waveform inversion. Submitted to IEEE Transactions on geoscience and remote sensing, accepted.
- B. Sun, T. Alkhalifah, 2019, The application of an optimal transport to a preconditioned data matching function for robust waveform inversion, Geophysics,84(**6**):R923-R945
- B. Sun, T. Alkhalifah, 2019, Adaptive traveltime inversion, Geophysics. 84(**4**):U13-U29
- B. Sun, T. Alkhalifah, 2019, Robust Full-Waveform Inversion with Radon-domain Matching filter, Geophysics, 84(**5**): R707-R724
- B. Sun, T. Alkhalifah, 2018, Automatic WEMVA by focusing subsurface offset virtual sources, Geophysics. 83(**2**): T49-T68
- B. Sun, Chauris, H. and Ma, J., 2010, 3D post-stack one-way migration using curvelets, Journal of Seismic Exploration, 20: 257-271.
- B. Sun, J, Ma., H. Chauris, and H. Yang, 2009, Solving the wave equation in the curvelet domain: a multi-scale and multi-directional approach, Journal of Seismic Exploration, 18 (4), 385-399.
- B. Sun, T. Alkhalifah, 2018, A robust waveform inversion using a global comparison of modeled and observed data, The Leading Edge. 38(3):185-192.
- A.Alali, B. Sun, T. Alkhalifah, 2019, The Effectiveness of a Pseudo Inverse extended Born operator to handle lateral heterogeneity for imaging and velocity analysis applications. Geophysical Prospecting. Accepted.
- C. Zhang, B. Sun, 2016, Splitting Algorithm for the High Order Compact Finite Difference Scheme in Acoustic Finite Difference Modeling. Geophysics 81(6): T295-T302.(communicating author)
- T. Alkahalifah, B. Sun, Z. Wu, 2018, Full Model wavenumber inversion (FMWI): identifying sources of information for the elusive middle model wavenumbers, Geophysics,83(6):R587-R610.
- Z. Zhang, T. Alkhalifah, E. Z. Naeini, B. Sun, 2018, Multiparameter Elastic Full Waveform Inversion with Facies-based Constraints. Geophysical Journal International, 213(**3**):2112-2127
- C.Zhang, B. Sun, 2016, A non-split perfectly matched layer absorbing boundary condition for the second-order elastic wave equation. Journal of Seismic Exploration,25:513-525. (communicating author)
- Mi T L, B. Sun ,Yang H Z,2009,Adaptive mesh based on second generation wavelet simulation wave propagation for 2D acoustic wave equation. Chinese J. Geophysics. (in Chinese), 52(11): 2862~2869.

- B. Sun, T. Alkhalifah, 2019, Stereo optimal transport of the matching filter. 89th SEG annual meeting.
- B.Sun, T. Alkhalifah, 2019, Adaptive traveltime inversion with information entropy regularization. 89th SEG annual meeting.
- B. Sun, T. Alkhalifah, 2019, ML-desent: an optimization algorithm for FWI using machine learning. 89th SEG annual meeting.

- <u>B. Sun</u>, T. Alkhalifah, 2019, Adaptive Traveltime Inversion: Mitigating cycle-skipping by minimization of the moment of the matching filter distribution. 81th EAGE Conference & Exhibition.
- <u>B. Sun</u>, T. Alkhalifah, 2019, Salt body inversion using an optimal transport of the preconditioned matching filter. 81th EAGE Conference & Exhibition.
- <u>B. Sun</u>, T. Alkhalifah, 2018, The application of an optimal transport to a preconditioned data matching function for robust wave-form inversion. 88th SEG annual meeting.
- <u>B. Sun</u>, T. Alkhalifah, 2018, Mitigate Cycle Skipping in FWI: a generalized Instantaneous Travel-time Approach. 80th EAGE Conference & Exhibition.
- T. Alkhalifah, <u>B. Sun,</u> 2018 Sparse frequencies data inversion: an application to a near surface experiment. 80th EAGE Conference & Exhibition.
- Y. Choi, <u>B. Sun</u>, T. Alkhalifah, 2018, Application of Logarithmic Phase-only inversion to near surface data. 80th EAGE Conference & Exhibition.
- A. Alali, T. Alkhalifah, <u>B. Sun</u>, 2018, Accounting for lateral heterogeneity in a Pseudo Inverse Operator of the Extended Born. 80th EAGE Conference & Exhibition.
- B. Sun,T. Akhalifah, 2017, Wavefield Seperation By Energy Norm Born Scattering. SEG 87th annual meeting.
- <u>B. Sun</u>, T. Akhalifah, 2017, Automatic WEMVA by focusing subsurface offset virtual sources. 79th EAGE Conference & Exhibition.
- <u>B. Sun</u>, Ma, J., Chauris, H., and Yang, H., 2010, Solving the Wave Equation Using Curvelets, 72nd EAGE Conference and Technical Exhibition, Eur. Ass. of Geoscientists and Engineers (Barcelona)
- <u>B. Sun,</u> Wang Y., Yang H. 2011, Theoretical study of the wave equation migration velocity analysis using augmented Lagrange function,73nd EAGE Conference and Technical Exhibition, Eur. Ass. of Geoscientists and Engineers (Vienna)
- <u>B. Sun</u>, Ma, J., Chauris, H., and Yang, H., 2011, 3D post-stack one way migration in the Curvelet domain, 73nd EAGE Conference and Technical Exhibition, Eur. Ass. of Geoscientists and Engineers (Vienna)