

Research Outputs of Hongyu Liu (01/2024)

• Books/Monographs/Book Chapters

- [1] J. Li and H. Liu, *Numerical Methods for Inverse Scattering Problems*, Springer, Singapore, 2023. ISBN: 978-981-99-3771-4
- [2] H. Diao and H. Liu, *Spectral Geometry and Inverse Scattering Theory*, Springer, Cham, 2023. ISBN: 978-3-031-34614-9
- [3] Y. Deng and H. Liu, *Spectral Theory of Localized Resonances and Applications*, Springer, Singapore, 2024.
- [4] L. Borcea, H. Kang, H. Liu and G. Uhlmann, *Inverse Problems and Imaging*, Panoramas et Synthèses, Numéro 44, Société Mathématique de France, 2015. ISBN: 978-2-85629-793-3
- [5] J. Li, H. Liu and J. Zou, *An efficient multilevel algorithm for inverse scattering problem*, Advances in Computation and Intelligence, Lecture Notes in Computer Science, Springer-Berlin, 2007.

• Patents

H. Liu and D. Ho, *Method and system for generating a 3D image of a body shape*, accepted for US patent, Priority No. 17/736,382.

J. Li and H. Liu, *A real-time medical monitoring and alerting method based on mobile devices* (in Chinese), accepted for China Patent, Application Number: CN201510727435.0, Publicity Number: CN105306717A.

H. Liu, P. Meng and W. Yin, *Contactless 3D body reconstruction technology based on inverse acoustic scattering method* (in Chinese), filed for China patent, CityU Reference Number: PWG/PA/1569/8/2023

• Journal Publications

Submitted

- [1] H. Liu, Z. Miao and G. Zheng, Simultaneously cloaking electric and hydrodynamic fields via electro-osmosis, preprint, 2024.
- [2] H. Liu, Z. Miao and G. Zheng, Enhanced microscale hydrodynamic near-cloaking using electro-osmosis, preprint, 2024.
- [3] Y. Li, H. Liu and C. W. K. Lo, On inverse problems in predator-prey models, [arXiv:2312.09653](#)
- [4] H. Diao, R. Tang, H. Liu and J. Tang, Unique determination by a single far-field measurement for an inverse elastic problem, [arXiv:2311.16435](#)
- [5] M. Ding, R. Gong, H. Liu and C. W. K. Lo, Determining sources in the bioluminescence tomography problem, [arXiv:2311.05191](#)

- [6] L. Chen and H. Liu, A scattering theory on hyperbolic spaces, **arXiv:5194495**
- [7] H. Liu, Z. Miao and G. Zheng, Enhanced microscale hydrodynamical near-cloaking using electro-osmosis, **arXiv:2310.14635**
- [8] Y. Chang, Y. Guo, H. Liu and D. Zhang, A novel Newton method for inverse elastic scattering problems, **arXiv:2310.08126**
- [9] H. Diao, H. Liu and Q. Meng, Dislocations with corners in an elastic body with applications to fault detection, **arXiv:2309.09706**
- [10] Y. Jiang, H. Liu, T. Ni and K. Zhang, Inverse problems for nonlinear progressive waves, **arXiv:2308.07808**
- [11] M. Ding, H. Liu and G. Zheng, Determining a stationary mean field game system from full/partial boundary measurement, **arXiv:2308.06688**
- [12] C. L. Lin, H. Liu and C. W. K. Lo, Strong uniqueness principle for fractional polyharmonic operators and applications to inverse problems, **arXiv:2307.00744**
- [13] M. Klibanov, J. Li and H. Liu, Coefficient inverse problems for a generalized mean field games system with the final overdetermination, **arXiv:2305.01065**
- [14] H. Liu and S. Zhang, Simultaneously recovering running cost and Hamiltonian in Mean Field Games system, **arXiv:2303.13096**
- [15] Y. Deng, L. Kong, H. Liu and L. Zhu, Elastostatics with multi-layer metamaterial structures and an algebraic framework for polariton resonances, **arXiv:2302.13983**
- [16] K. Liu and H. Liu, On forward and inverse problems for the DCIS model in mathematical biology, preprint, 2023.
- [17] H. Liu and S. Zhang, On an inverse boundary problem for mean field games, **arXiv:2212.09110**
- [18] H. Diao, X. Fei, H. Liu and L. Wang, Determining anomalies in a semilinear elliptic equation by a minimal number of measurements, **arXiv:2206.02500**
- [19] H. Diao, X. Fei and H. Liu, Local geometric properties of conductive transmission eigenfunctions and applications, **arXiv:2206.01933**

In Revision

- [1] Y. Deng, H. Liu and Y. Wang, Identifying active anomalies in a multi-layered medium by passive measurement in EIT, *SIAM J. Appl. Math.*, 2023.
- [2] P. Meng, J. Zhuang, W. Yin and H. Liu, A stable neural network for inverse scattering problems with contaminated data, *J. Inverse and Ill-posed Problems*, 2023
- [3] H. Diao, H. Liu and L. Tao, Stable determination of an impedance obstacle by a single far-field measurement, *Inverse Problems*, **arXiv:2302.01083**

Accepted/In Press

- [1] B. Chen, Y. Gao and H. Liu, Resonant modal approximation for time-domain nano-bubbles in elastic materials, *SIAM Multiscale Model. Simul.*, [arXiv:2210.15352](#)
- [2] Y. He, H. Liu and X. Wang, Invisibility enables super-visibility in electromagnetic imaging, *ESAIM: Math. Model. Numer. Anal.*, [arXiv:2112.07896](#)
- [3] Y.-H. Lin, H. Liu and X. Liu, Determining a nonlinear hyperbolic system with unknown sources and nonlinearity, *J. London Math. Soc.*, [arXiv:2107.10219](#)
- [4] O. Imanuvilov, H. Liu and M. Yamamoto, Lipschitz stability for determination of states and inverse source problem for the mean field game equations, *Inverse Problems and Imaging*, [arXiv:2304.06673](#)
- [5] M. Klibanov, J. Li and H. Liu, On the mean field games system with the lateral Cauchy data via Carleman estimates, *J. Inverse and Ill-posed Problems*, [arXiv:2303.07556](#)
- [6] H. Diao, X. Fei, H. Liu and K. Yang, Visibility, invisibility and unique recovery of inverse electromagnetic problems with conical singularities, *Inverse Problems and Imaging*, [Doi: 10.3934/ipi.2023043](#), 2023.
- [7] H. Liu, Z. Miao and G. Zheng, A mathematical theory of microscale hydrodynamic cloaking and shielding by electro-osmosis, *SIAM J. Appl. Math.*, [arXiv:2302.07495](#)
- [8] H. Ammari, Y. T. Chow, H. Liu and M. Sunkula, Quantum integrable systems and concentration of plasmon resonance, *J. Eur. Math. Soc. (JEMS)*, [arXiv:2109.13008](#)

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- [1] H. Liu and C. W. K. Lo, Determining a parabolic system by boundary observation of its non-negative solutions with biological applications, *Inverse Problems*, **40** (2024), no. 2, 025009, 24 pp.
- [2] K. Liu and H. Liu, Direct imaging of inhomogeneities in a 3D shallow ocean waveguide with an icecap, *J. Comput. Phys.*, **498** (2024), Paper No. 112694.
- [3] R. Chen, Y. Deng, Y. Gao, J. Li and H. Liu, Locating multiple magnetized anomalies by geomagnetic monitoring, *J. Comput. Phys.*, **498** (2024), Paper No. 112661.
- [4] H. Diao, Y. Geng, H. Liu and Q. Yu, Geometrical characterizations of non-radiating sources at polyhedral and conical corners with applications, *Commun. Math. Res.*, **39** (2023), no. 4, 523–538.
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- [12] Y. He, H. Liu and X. Wang, A novel quantitative inverse scattering scheme using interior resonant modes, *Inverse Problems*, **39** (2023), no. 8, Paper No. 085002, 24 pp.
- [13] Y. Chang, Y. Guo, H. Liu and D. Zhang, Recovering source location, polarization, and shape of obstacle from elastic scattering data, *J. Comput. Phys.*, **489** (2023), Paper No. 112289.
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