Curriculum Vitae

Jiheng Hu

Ph.D. in Geophysics

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Education

2020–2023	**Ph.D., Geophysics,** University of Science and Technology of China. Supervisor: Prof. Rui Li. Thesis title: *Satellite Remote Sensing and Numerical Modeling of Microwave Land Surface Radiative Characteristics under All-weather Conditions.*
2016 – 2019	**M.S., Atmospheric Science,** University of Science and Technology of China. Supervisor: Prof. Rui Li. Thesis title: *Construction of Microwave Land Surface Emissivity Database in East Asia and Its Application in Vegetation Remote Sensing.*
2012 – 2016	**B.S., Atmospheric Science,** University of Science and Technology of China. Supervisor: Prof. Rui Li. Thesis title: *Impacts of Cloud Horizontal Inhomogeneity on Microwave Radiation Transfer in Atmosphere.*

Research Interests

1. **Surface Emissivity and EDVI index Retrieval.** To develop algorithms of retrieving all-weather microwave land surface emissivity and the associated Emissivity Difference Vegetation Index (EDVI) using passive microwave (PMW) remote sensing. The related databases benefit the endeavors in monitoring surface ecohydrological dynamics and the retrievals of over-land atmospheric parameters.

2. **Quantify the VWC variations using multichannel PMW signals and surface numerical modeling.** Study the spatiotemporal variations of the multichannel EDVIs and quantify the index in indicating the Vegetation Water Content (VWC) variation and its vertical profile in a layered canopy. To archive this goal, I am also focus on developing one-/multi-layered canopy microwave radiative transfer (RT) model which considers variated vertical VWC profiles as input. The vertical VWC structure is useful in fire behavior prediction, land surface modelling and plants hydraulic models.

Skills

Remote Sensing: Surface variable retrievals (Emissivity, VOD, SMC), Remote sensing data analysis and assimilations, Resolution-enhancement (Backus-Gilbert, rSIR), Cross-calibrations (SNO, SCO), Sensitivity tests.

Model Development: RT model development, Surface parameterizations, Machine learning, Computing cluster maintenance.

Peer-Reviewed Publications

1. **Hu, J.**, Li, R., Wang, Y., & Fu., Y. (2023). The diversity in canopy vertical hydrological structure as indicated by multichannel passive microwave signals over south Asia. *under review*.

2. Wang, Y., **Hu, J.***, Li, R.*, Song, B., Hailemariam, M., Fu, Y., & Duan, J. (2023). Increasing cloud coverage deteriorates evapotranspiration estimating accuracy from satellite, reanalysis and land surface models over East Asia. Geophysical Research Letters, 50, e2022GL102706. https://doi.org/10.1029/2022GL102706

3. **Hu, J.**, Fu, Y., Zhang, P., Min, Q., …, & Li, R. (2021). Satellite retrieval of microwave land surface emissivity under clear and cloudy skies in china using observations from AMSR-E and MODIS. *Remote Sensing, 13(19), 3980.*

4. Li, R., **Hu, J.**, Wu, S., Zhang, P., ..., & Sun, L. (2022). Spatiotemporal variations of microwave land surface emissivity (MLSE) over China derived from four-year recalibrated Fengyun 3B MWRI data. *Advances in Atmospheric Sciences, 39, 1536–1560*

5. **Hu, J.**, Li, R., Wang, Y., et al. (2020). Analysis of the characteristics of satellite-derived multiple channel microwave emissivity difference vegetation index (EDVI) over different vegetation types. *Journal of University of Science and Technology of China, 50(4), 528-541.*

6. Zhang, Y., **Hu, J.**, Gu, D., Bo, H., …, & Li, R. (2022). Simulation of isoprene emission with satellite microwave emissivity difference vegetation index as water stress factor in southeastern China during 2008. *Remote Sensing, 14(7), 1740.*

7. Fu, Y., Li, R., **Hu, J.**, Wang, Y., & Duan, J. (2022). Investigating the impacts of satellite fire observation accuracy on the top-down nitrogen oxides emission estimation in northeastern Asia. *Environment International, 169, 107498.*

8. Wang, Y., Li, R., **Hu, J.**, Fu, Y., …, & Song, B. (2022). Evaluation of evapotranspiration estimation under cloud impacts over China using ground observations and multiple satellite optical and microwave measurements. *Agricultural and Forest Meteorology, 314, 108806.*

9. Wang, Y., Li, R., **Hu, J.**, Fu, Y., Duan, J., & Cheng, Y. (2021). Daily estimation of gross primary production under all sky using a light use efficiency model coupled with satellite passive microwave measurements. *Remote Sensing of Environment, 267, 12721.*

10. Wang, Y., Li, R., **Hu, J.**, Fu, Y., …, & Song, B. (2021). Understanding the non-linear response of summer evapotranspiration to clouds in a temperate forest under the impact of vegetation water content. *Journal of Geophysical Research: Atmospheres, 126(23).*

11. Wang, Y. P., Li, R., **Hu, J.**, Wang, X., …, & Wang, Y. (2021). Evaluations of MODIS and microwave based satellite evapotranspiration products under varied cloud conditions over East Asia forests. *Remote Sensing of Environment, 264, 112606.*

Conference Proceedings

1. **Hu, Jiheng** & Li, Rui, (December, 2018). A microwave land surface emissivity database in China. In *AGU Fall Meeting 2018* (Vol. 2018, pp. B31M-2654). Washington D.C., USA.

2. **Hu, Jiheng**, (November, 2021). Satellite retrieval of microwave land surface emissivity and its applications in vegetation remote sensing. In *2021 Congress of the International Research Network on Cold Forests* (Block. 3). Hefei, China.

3. Rui LI, **Jiheng HU**, Husi LETU, Takashi NAKAJIMA, & Yu WANG, (August, 2021). Combine satellite observations from Himawari-8 and GPM to retrieve land surface microwave emissivity and vegetation hydrological properties under cloudy and clear sky. In *AOGS 18th Annual Meeting* (AS39-A013). AOGS Online.

4. **Hu, Jiheng** & Li Rui, (July, 2021). Retrieval of land surface microwave emissivity by combining

visible, infrared and microwave signals from multi-source satellites remote sensing. In *the 7th Young Scientist Forum of Earth Science* (S7B5-1872). Guiyang, China.

5. **Hu, Jiheng** & Li Rui, (November, 2019). The applications of multiple channel microwave Emissivity Difference Vegetation Index (EDVI) in vegetation remote sensing. In *the 6th Young Scientist Forum of Earth Science*. Xining, China.

6. **Hu, Jiheng,** & Li, Rui. (2018). Improvement on surface microwave emissivity retrieval algorithm from multi-source satellite remote sensing. In *the 35th Annual Meeting of the Chinese Meteorological Society.* Hefei, China.

Awards

2023	USTC Outstanding Graduate
2022	China Aerospace Science and Technology Corporation (CASC) Scholarship for Outstanding Students
2016-2022	USTC Academic Scholarship (Grade 1)
2013, 2015	USTC Outstanding Student Scholarship (Grade 3)
2013	Xianzi Zeng Scholarship for Excellent Students
2012	USTC Outstanding Student Scholarship (Grade 3)

Professional Experience

2019.09-2020.08	**University of Science and Technology of China (USTC)** Research Assistant
2019.06-2019.08	**TP-Link Technology Co. Ltd., Shenzhen, China** Cloud Computing Development Engineer (Full-time)
2018.06-2018.08	**Iflytek Co. Ltd., Hefei, China** Back-end Development Engineer (Internship)
2018.05-present	**The Computing Center of Rui Li's Research Group in USTC** Computing Cluster Administrator & Maintainer

Teaching Experience

2022	**Teaching Assistant** *Passive Microwave Remote Sensing of Atmosphere*

Mentoring Experience

2022-present	Qingyang Liu, on retrieval of FY-3D/MWRI global surface emissivity (M.S. program).
2020-present	Liting Mai, on cloud ice RT simulations at ICESat frequencies (B.S. dissertation); on GPM mission active/passive RT simulations (M.S. program).
2020-2021	Binbin Song, on the relationship between GMI surface emissivity and wild fire radiative power in Sichuan, China (B.S. dissertation).

Community Experience

2021	Facilitator of the 2021 congress of IRN on Cold Forests
2021	Volunteer of the workshop of National Natural Science Foundation of China (NSFC) Working Group on subject D0509
2018	Volunteer of the Chinese Academy of Sciences Public Science Day

2017   Volunteer of the Fifth International Symposium on Atmospheric Light Scattering and Remote Sensing

Participated Grants

2016-2020   **Belmont Forum - National Natural Science Foundation of China (NSFC), International Coopertive Program,** "Improving PREdictability of circumboREAL Forest Fire Activity and its Ecological and Socio-Economic Impacts through Multi-Proxy Data Comparisons".

2017-2020   **NSFC, General Program,** "Studies of the Dynamic Response of Microwave Land Surface Emissivity to Cloud and Rain in China".

2021-2024   **NSFC, Key Program,** "Research on the principle and method of remote sensing of combustible characteristics of forest vertical stratification in complex environment".

2023-2026   **NSFC, General Program, "**Research on Satellite Passive Microwave Bayesian Inversion of China's Land Precipitation under Surface Specific Emissivity Constraints".