

# Shunji Kotsuki, Ph. D. (小槻 峻司)

Professor

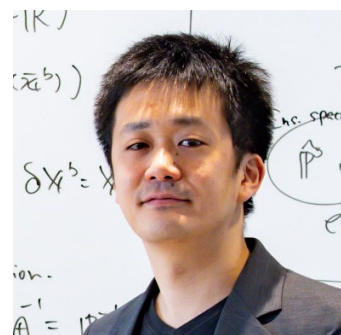
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## Professional Experience

### **2022-07–Present Professor**

Institute for Advanced Academic Research (IAAR)), Chiba University, Japan, Chiba University (concurrent; Center for Environmental Remote Sensing (CEReS) since 2022/06), Research Institute of Disaster Medicine (RIDM) since 2023/05, and Department of Information Engineering, Faculty of Engineering; since 2020/01)

### **2019/11–Present Visiting Scientist**

Data Assimilation Research Team, RIKEN Center for Computational Science (R-CCS), Kobe, Japan

### **2019/10–2023/03 Researcher**

PRESTO, Japan Science and Technology Agency, Kobe, Japan

### **2019/11–2022/06 Associate Professor**

Center for Environmental Remote Sensing (CEReS), Chiba University, Japan, Chiba University

### **2019/04–2019/10 Research Scientist**

Prediction Science Laboratory, RIKEN Cluster for Pioneering Research, Kobe, Japan

### **2018/05–2019/10 Affiliate Associate Professor**

Graduate School of Science, Kyoto University, Japan

### **2018/04–2019/10 Research Scientist**

Data Assimilation Research Team, RIKEN Center for Computational Science (R-CCS), Kobe, Japan

### **2018/04–2019/10 Research Scientist**

Data Assimilation Research Team, RIKEN interdisciplinary Theoretical and Mathematical Sciences Program (iTHEMS), Kobe, Japan

### **2017/10–2019/10 Excellent Young Researcher**

Initiative for Excellent Young Researchers, Ministry of Education, Culture, Sports, Science and Technology, Japan

### **2017/04–2019/10 Part-time Lecturer**

Graduate School of Science, Kyoto University, Japan

**2017/10–2018/03 Research Scientist**

Data Assimilation Research Team, RIKEN Advanced Institute for Computational Science (AICS), Kobe, Japan

**2014/01–2017/10 Postdoctoral Researcher**

Data Assimilation Research Team, RIKEN Advanced Institute for Computational Science (AICS), Kobe, Japan

**2013/12–2013/12 Postdoctoral Researcher**

Japan Society for the Promotion of Science, Japan

**2012/04–2013/11 Research Fellow**

Japan Society for the Promotion of Science, Japan

**2011/04–2012/03 Research Assistant**

Disaster Prevention Research Institute, Kyoto University, Japan

**Education**

**2013/11 Ph. D. Engineering (Urban Management Engineering)**

Graduate School of Engineering, Kyoto University, Japan

**2011/03 M. S. Engineering (Urban Management Engineering)**

Graduate School of Engineering, Kyoto University, Japan

**2009/03 B. S. Engineering (Civil Engineering)**

Faculty of Engineering, Kyoto University, Japan

**Awards to Research Achievements**

**2022/04 Young Scientist Award**

Ministry of Education, Culture, Sports, Science, and Technology, Japan  
"Environmental Prediction Studies using Satellite Big Data and Supercomputers"

**2021/11 Chiba University Award for Distinguished Researcher**

"Environmental and Disaster Predictions Through Numerical Simulation and Data Assimilation with High Performance Computers"

**2019/03 RIKEN Ohbu Award**

RIKEN Incentive Research Award, Japan  
"Advancing Ensemble Data Assimilation-based Global Weather Forecast System"

**2017/10 Leading Initiative for Excellent Young Researchers (LEADER)**

Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan  
"Advancing Real-Time Weather and Hydrological Predictions with Data Assimilation and Artificial Intelligence"

**2013/09 Thesis Award for Young Scientists**

Japan Society of Hydrology and Water Resources

**2013/02 HUME Prize (Top three master dissertation of the department)**  
Department of Urban Management, Graduate School of Engineering, Kyoto University, Japan

### **Awards to Presentations**

**2021/09 Outstanding Presentation Award**  
JSHWR-JAHS Joint Symposium in 2021

**2021/06 Outstanding Discussion Award**  
65th Conference of Japan Society of Civil Engineers, Japan

**2020/11 Outstanding Presentation Award**  
5th Global Prominent Symposium of Chiba University, Japan

**2020/06 Outstanding Discussion Award**  
64th Conference of Japan Society of Civil Engineers, Japan

**2013/08 Outstanding Presentation Award**  
6th Conference of the Asia Pacific Association of Hydrology and Water Resources

**2013/05 Best Presentation Award**  
Remote Sensing Society of Japan

**2013/02 Best Presentation Award**  
Annual Conference, Disaster Prevention Research Institute, Kyoto University, Japan

### **Funded Projects as the lead PI**

**2023/04–2030/03 FOREST (Fusion Oriented Research for Disruptive Science and Technology), JST, Japan**  
Foreseeing Unprecedented Flood Disasters through Integration of Simulation Science and Folklore (65,000K JPY)

**2022/06–2025/03 Grant-in-Aid for Challenging Research (Exploratory), JSPS, Japan**  
Exploring Cost-effective Observation Placements Using The Data-driven Sparse Sensor Placement (6,500 K JPY)

**2022/06–2024/03 Grants-in-Aid for Transformative Research Areas Foundation (A) (Publicly Offered Research), JSPS, Japan**  
Investigating Flood Risk Impacts on Local Community Developments through Numerical Simulations and Area Studies (10,400K JPY)

**2022/04–2028/03 Advanced Academic Research Support Program (top leader), Chiba University, Japan**  
Exploring Frontiers in Global Environment and Disaster Predictions Through Integration of Big Satellite Observations and Data Science (about 80,000K JPY)

**2022/04–2025/03 JAXA Third Research Announcement (RA3), JAXA, Japan**  
Advancing GSMaP Precipitation by Land Data Assimilation and Data Science (about 13,000K JPY)

- 2022/04–2025/03 MOONSHOT Research & Development Program (feasibility), JST, Japan**  
Quantifying Weather Controllability and Mitigatable Flood Damage Based on Ensemble Weather Forecast (about 80,000K JPY)
- 2021/04–2025/03 Grants-in-Aid for Scientific Research Foundation (A), JSPS, Japan**  
Exploring Real-time Rainfall and Flood Predictions in Fugaku Era with the State-of-the-art Data Science (41,860K JPY)
- 2019/10–2023/03 PRESTO (Precursory Research for Embryonic Science and Technology), JST, Japan**  
Advancing Data Assimilation and Prediction Methods to Maximize "The Value of Observations" (82,160K JPY)
- 2018/04–2020/03 Grants-in-Aid for Scientific Research Foundation (B), JSPS, Japan**  
Land-Atmosphere-Coupled Data Assimilation: Improving Atmospheric and Hydrological Predictions by Hydrological Big Data Assimilation (17,420K JPY)
- 2017/10–2019/03 Leading Initiative for Excellent Young Researchers, MEXT, Japan**  
Advancing Real-Time Weather and Hydrological Predictions with Data Assimilation and Artificial Intelligence (18,000K JPY)
- 2015/04–2018/03 Grant-in-Aid for Young Scientists (B), JSPS, Japan**  
Process-based Crop Yield Prediction Using Satellite Observations (4,160K JPY)
- 2012/04–2013/12 Grant-in-Aid for Fellows, JSPS, Japan**  
Estimating Global Crop Yield Potential Using a Global Agricultural Water Resources Model (1,800K JPY)

### **Funded Projects as the Co-PI (& Funds as Co-PI)**

- 2022/06–2025/03 Grants-in-Aid for Challenging Research (Exploratory), JSPS, Japan, PI: Prof. K. Ichii (U. Chiba)**  
English Title TBD (環北極域における超高頻度衛星観測データの創出による陸面劇的変動の早期高精度検出)
- 2021/07–2026/03 Grants-in-Aid for Scientific Research Foundation (S), JSPS, Japan, PI: Prof. T. Oki (U. Tokyo)**  
Study on global terrestrial hydrodynamics with satellite earth observations (20,930K JPY)
- 2021/04–2024/03 Environment Research and Technology Development Fund of the Ministry of the Environment, Japan [Strategic Research] PI: Prof. K. Ichii (Chiba U.)**  
English Title TBD (観測データ及びモデル推定の統合解析による陸域のGHG収支評価; 15,000K JPY)
- 2021/04–2024/03 Environment Research and Technology Development Fund of the Ministry of the Environment, Japan [Young Research] PI: Prof. Y. Igarashi (Fukushima U.)**  
Prediction System for Radionuclides Redistribution due to Wild Fire in Contaminated Regions (10,946K JPY)

**2020/04–2022/03 河川砂防技術研究開発公募, PI: Prof. S. Watanabe (U. Tokyo)**

English Title TBD (大規模気候データを活用したこれからの河川計画策定に向けた技術開発; 343.2K JPY)

## **Cooperative Research Projects**

**2022/04–2027/03 JSPS Core-to-Core Program, PI: Prof. Ichii (Chiba U.)**

GEOLAND-NET (GEOstationary-satellite LAND monitoring NETwork)

**2022/04–2027/03 Advanced studies of climate change projection, MEXT, Japan, PI: Prof. Mori (Kyoto U.)**

English Title TBD (ハザード統合予測モデルの開発)

**2022/04–2025/03 JAXA Third Research Announcement, PI: Prof. Miyoshi (RIKEN)**

Advances and applications of satellite data assimilation of clouds, precipitation, and the ocean

**2021/07–2025/03 JST Mirai Program, PI: Prof. H. Tsukada (Chubu U.)**

English Title TBD (非線形・複雑系に着目した認知症のロバストネス数理モデルとそのハブ因子の解明)

**2020/07–2025/03 JICA-JST SATREPS (Science and Technology Research Partnership for Sustainable Development), PI: Prof. K. Tanaka (Kyoto U.)**

Development of Innovative Climate Resilient Technologies for Monitoring and Controlling of Water Use Efficiency and Impact of Salinization on Crop Productivity and Livelihood in Aral Sea Region

**2020/04–2023/03 Program for Promoting Researches on the Supercomputer Fugaku, MEXT, PI: Prof. M. Satoh (U. Tokyo)**

Large Ensemble Atmospheric and Environmental Prediction for Disaster Prevention and Mitigation

**2020/04–2023/03 Global Prominent Research of Chiba University, PI: Prof. N. Tsumura**

Creation of Material Appearance and Affective Imaging

**2020/04–2023/03 JAXA Precipitation Measurement Mission, PI: Prof. Miyoshi (RIKEN)**

Enhancing Precipitation Prediction Algorithm by Data Assimilation of GPM Observations

**2013/04–2016/03 地球観測技術等調査研究委託事業, PI: Prof. A. Higuchi (Chiba U.)**

食糧安全保障に向けた衛星入力を活用した環太平洋域での広域収量推定および短期予測の試み

## **Seeding Funds**

**2021/04–2022/03 ERAN Collaborative Research for Young Scientists, PI: Dr. J. Hu of Kotsuki Lab.**  
Quantify the fire trends and resuspension radionuclides using remote sensing data for radioactively contaminated forests in Ukraine

**2020/04–2021/03 FY2020 ERAN Collaborative Research for Young Scientists**  
Implementing Radioactive Transport/Diffusion Modules into an Integrated Hydrological Model for Long-term Projections

### **Press Release**

**2021/07/07** **Improving Typhoon Prediction with Geostationary Radar Observation**  
[https://www.riken.jp/press/2021/20210707\\_1/index.html](https://www.riken.jp/press/2021/20210707_1/index.html)

**2020/08/20** **Global Precipitation Forecasting System by Simulation and Satellite Obs.**  
[https://www.eorc.jaxa.jp/theme/NEXRA/index\\_e.htm](https://www.eorc.jaxa.jp/theme/NEXRA/index_e.htm)

### **Certifications**

**2015** **Certified and Accredited Meteorologists of Japan (ID: 9466)**

**2009** **First-class National Government Employee with specialty in Engineering**  
National Personnel Authority, the Government of Japan

### **Editorship of Scientific Journals**

**2020/06–Present** **Editor, Journal of the Meteorological Society of Japan**

**2020/09–Present** **Editor, Journal of the Japan Society of Hydrology and Water Resources**

### **Committee Member of Scientific Activities**

**2022/12–Present** **Member of Hydrology Division, Committee on Hydrosience and Hydraulic Engineering, JSCE**

**2022/09–Present** **Working Group Member of IHP-IX Strategic Plan (Theme 3: Bridging the data and knowledge gap)**

**2022/09–Present** **水文・水資源学会 JpGU 対応委員会 委員**

**2022/07–Present** **JAXA・地球観測に関する科学アドバイザー委員会・PMM 分科会（後継ミッション検討グループ & 利用促進検討グループ）**

### **Outreach**

**2018/11–Present** **JAXA Real-time Weather Watch (contributing as a developer)**  
[https://www.eorc.jaxa.jp/theme/NEXRA/index\\_e.htm](https://www.eorc.jaxa.jp/theme/NEXRA/index_e.htm)

2017/05–2019/10 Weather Forecaster, RIKEN Weather Forecast  
<https://weather.riken.jp/index.html>

### **Scientific Organizing Committee**

The RIKEN International School on Data Assimilation (RISDA 2018), Jan. 22-26, 2018.

### **Local Conference Organization (Co-Chair)**

The 7th International Symposium on Data Assimilation (ISDA2019), Jan. 21-24, 2019. (co-chair)

The RIKEN International School on Data Assimilation (RISDA 2018), Jan. 22-26, 2018. (co-chair)

### **Proposal Review**

FY2018 RIKEN Incentive Research Projects

### **Referee of Scientific Journals**

- (01) Atmosphere (by MDPI)
- (01) Earth, Planets and Space (by Springer)
- (01) Earth and Space Sciences (by AGU)
- (01) Hydrology and Earth System Sciences (by EGU)
- (03) Hydrological Research Letters (by JSHWR)
- (01) Journal of Agricultural Meteorology (by SAMJ)
- (01) Journal of Geophysical Research – Atmospheres (by AGU)
- (03) Journal of Hydrology (by Elsevier)
- (07) Journal of Meteorological Society of Japan (by MSJ)
- (01) Meteorological Applications (by RMS)
- (01) Meteorology and Atmospheric Physics (by Springer)
- (03) Monthly Weather Review (by AMS)
- (05) Nonlinear Processes in Geophysics (by EGU)
- (04) Scientific Online Letters on the Atmosphere (by MSJ)
- (01) Tellus (by MISU Stockholm U.)

水文・水資源学会誌 (03)

土木学会・水工学論文集 (06)

土木学会論文集 (01)

ながれ (01)

## **Affiliations**

Japan Geoscience Union

Japan Society of Civil Engineers

Japan Society of Hydrology and Water Resources

Meteorological Society of Japan

The Remote Sensing Society of Japan

## **Editorship/Committee Member of Scientific/Social Activities**

**2017/01-2018/12 Columns by Senior Researchers, Japan Society of Hydrology and Water Resources**

**2015/01-2016/12 Columns by Young Researchers, Japan Society of Hydrology and Water Resources**

**2015/06-2017/05 Associate Member, Committee on Hydrosience and Hydraulic Engineering, Japan Society of Civil Engineers**

## **Awards to Supervised Researchers/Students**

- |                |  |
|----------------|--|
| <b>2023/02</b> | <b>Paper Encouragement Award, Committee on Hydraulic Engineering, Japan Society of Civil Engineers</b><br>藤村健介 (M1) “降雨流出氾濫モデルのアンサンブルデータ同化安定化に関する研究” |
| <b>2023/02</b> | <b>Outstanding Presentation Award, Remote Sensing Course, Chiba University</b><br>大石健 (M2) “Sinkhorn アルゴリズムを用いて高速化された局所粒子フィルタの開発”                    |
| <b>2022/12</b> | <b>Outstanding Presentation Award, Remote Sensing Course, Chiba University</b><br>齋藤匠 (M1) “特異ベクトル空間におけるデータ同化と観測位置決定手法への応用”                          |
| <b>2022/10</b> | <b>Outstanding Presentation Award, JSHWR-JAHS Joint Symposium in 2022</b><br>塩尻大也 (PD) “スパースセンサ位置最適化手法を活用した効率的な雨量計位置決定”                              |



2021/12

**Outstanding Presentation Award, Remote Sensing Course, Chiba University**  
土屋建 (M1) “GradCAM を用いた熱帯低気圧画像識別器の高度化”

### **Brief Narrative Summary**

**Dr. Shunji Kotsuki** is a Professor of Institute for Advanced Academic Research (IAAR), Chiba University, and leading "Environmental Prediction Science". He received his B.S. (2009), M.S. (2011) and Ph. D. (2013) degrees in civil engineering from Kyoto University. He experienced his professional career as Post-doctoral Researcher (2014-2017), and Research Scientist (2017-2019) at RIKEN Center for Computational Science (R-CCS). He started leading his research laboratory on Environmental Prediction Science at CEReS, Chiba University since November, 2019. He promoted to be a Professor of IAAR on July 2022.

Dr. Kotsuki is a leading scientist on data assimilation and numerical weather prediction with over 8 years of research experience in development of the global atmospheric data assimilation system (a.k.a. NICAM-LETKF). His research interests are in data assimilation mathematics, model parameter estimation, observation diagnosis including impact estimates, satellite data analysis, hydrological modeling, and atmospheric and hydrological disaster predictions. His techniques for an adaptive covariance inflation and assimilating observations with non-Gaussian errors have been incorporated in the RIKEN's global atmospheric data assimilation system, and improved its weather forecasts significantly. The NICAM-LETKF is running operationally as NEXRA since 2017 on The JAXA's supercomputing system.

In 2017, Dr. Kotsuki was selected as an Excellent Young Researcher by Ministry of Education, Culture, Sports, Science and Technology, Japan. He has been recognized by several prestigious awards such as the Thesis Award for Young Scientists from Japan Society of Hydrology and Water Resources Engineering (2013), RIKEN Ohbu Research Incentive Award (2019), Chiba University Award for Distinguished Researcher (2020), and Young Scientist Award of MEXT (2022). He is also the PRESTO researcher of JST, and visiting scientist of R-CCS, and exploring data-driven approaches for the environmental prediction science.

## **Publications: Peer-reviewed Articles (\*: Corresponding Author)**

- [37]. Hu, J., Igarashi, Y., **Kotsuki, S.\***, Yang, Z., Talerko, M., Landin, V., Tischenko, O., Zheleznyak, M., Protsak, V., and Kirieiev, S. (2023): Application of a tuning-free burned area detection algorithm to the Chornobyl wildfires in 2022. *Sci. Rep.*, 13, 5236. doi: [10.1038/s41598-023-32300-5](https://doi.org/10.1038/s41598-023-32300-5)
- [36]. **Kotsuki, S.\***, Terasaki, K., Satoh, M., and Miyoshi, T. (2023): Ensemble-based Data Assimilation of GPM DPR Reflectivity: Cloud Microphysics Parameter Estimation with the Nonhydrostatic Icosahedral Atmospheric Model (NICAM), *J. Geophys. Res.*, 128, e2022JD037447. doi: [10.1029/2022JD037447](https://doi.org/10.1029/2022JD037447)
- [35]. Momoi, M., **Kotsuki, S.**, Kikuchi, R., Watanabe, S., Yamada, M., and Abe, S. (2023): Emulating rainfall-runoff-inundation model using deep neural network with dimensionality reduction. *Artificial Intelligence for the Earth Systems*, 2, 1-25. doi: [10.1175/AIES-D-22-0036.1](https://doi.org/10.1175/AIES-D-22-0036.1)
- [34]. Ouyang, M., **Kotsuki, S.**, Ito, Y., and Tokunaga, T. (2022): Employment of hydraulic model and social media data for flood hazard assessment in an urban city. *J. Hydrol. Reg. Stud.*, 44, 101261. doi: [10.1016/j.ejrh.2022.101261](https://doi.org/10.1016/j.ejrh.2022.101261)
- [33]. **Kotsuki, S.\***, Miyoshi, T., Kondo K., and Potthast R. (2022): A Local Particle Filter and Its Gaussian Mixture Extension Implemented with Minor Modifications to the LETKF. *Geosci. Model Dev.*, 15, 8325-8348. doi: [10.5194/gmd-15-8325-2022](https://doi.org/10.5194/gmd-15-8325-2022)
- [32]. **Kotsuki, S.\*** and Bishop, H. C. (2022): Implementing Hybrid Background Error Covariance into the LETKF with Attenuation-based Localization: Experiments with a Simplified AGCM. *Mon. Wea. Rev.*, 150, 283-302. doi:[10.1175/MWR-D-21-0174.1](https://doi.org/10.1175/MWR-D-21-0174.1)
- [31]. Miyoshi, T., Terasaki, K., **Kotsuki, S.**, Otsuka, S., Chen, Y.-W., Kanemaru, K., Okamoto, K., Kondo, K., Lien, G.-Y., Yashiro, H., Tomita, H., Sato, M., and Kalnay, E. (2022): Enhancing data assimilation of GPM observations. *Precipitation Science, Measurement Remote Sensing, Microphysics, and Modeling*. Elsevier, 787-804. doi:[10.1016/B978-0-12-822973-6.00020-2](https://doi.org/10.1016/B978-0-12-822973-6.00020-2)
- [30]. Arakida, H., **Kotsuki, S.**, Otsuka, S., Sawada, Y., and Miyoshi, T. (2021): Regional-scale data assimilation with the Spatially Explicit Individual-based Dynamic Global Vegetation Model (SEIB-DGVM) over Siberia. *Prog. Earth Planet. Sci.* 8:52. doi:[10.1186/s40645-021-00443-6](https://doi.org/10.1186/s40645-021-00443-6)
- [29]. Taler, J., Okazaki, A., Honda, T., **Kotsuki, S.**, Yamaji, M., Kubota, T., Oki, R., Iguchi, T., and Miyoshi, T. (2021): Oversampling Reflectivity Observations from a Geostationary Precipitation Radar Satellite: Impact on Typhoon Forecasts within a Perfect Model OSSE Framework. *J. Adv. Modeling Earth Syst.*, 13, e2020MS002332. doi:[10.1029/2020MS002332](https://doi.org/10.1029/2020MS002332)
- [28]. Carrio, D. S., Bishop, C. H. and **Kotsuki, S.** (2021): Empirical determination of the covariance of forecast errors: an empirical justification and reformulation of Hybrid covariance models. *Q. J. R. Meteorol. Soc.* 147, 2033-2052. doi:[10.1002/qj.4008](https://doi.org/10.1002/qj.4008)
- [27]. Watanabe, S., **Kotsuki, S.**, Kanae, S., Tanaka, K. and Higuchi, A. (2020): Snow water scarcity induced by the record-breaking warm winter in 2020 in Japan. *Sci. Rep.*, 10, 18541. doi:[10.1038/s41598-020-75440-8](https://doi.org/10.1038/s41598-020-75440-8).
- [26]. **Kotsuki, S.\***, Pensoneault, A., Okazaki, A. and Miyoshi, T. (2020): Weight Structure of the Local Ensemble Transform Kalman Filter: A Case with an Intermediate AGCM. *Q. J. R. Meteorol. Soc.*, 146, 3399-3415. doi: [10.1002/qj.3852](https://doi.org/10.1002/qj.3852)

- [25]. Miyoshi, T., **Kotsuki, S.**, Terasaki, K., Otsuka, S., Lien, G.-Y., Yashiro, H., Tomita, H., Satoh, M., and Kalnay, E. (2020): Precipitation Ensemble Data Assimilation in NWP Models. Satellite Precipitation Measurement. *Advances in Global Change Research*, 69, Springer, 983-991. doi:10.1007/978-3-030-35798-6\_25
- [24]. **Kotsuki, S.\***, Sato, Y., and Miyoshi, T. (2020): Data Assimilation for Climate Research: Model Parameter Estimation of Large Scale Condensation Scheme. *J. Geophys. Res.*, 125, e2019JD031304. doi: 10.1029/2019JD031304
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- [22]. Okazaki, A., Honda, T., **Kotsuki, S.**, Yamaji, M., Kubota, T., Oki, R., Iguchi, T., and Miyoshi, T. (2019): Simulating precipitation radar observations from a geostationary satellite. *Atmos. Meas. Tech.*, 12, 3985-3996. doi: 10.5194/amt-2018-278
- [21]. **Kotsuki, S.\***, Kurosawa, K., Otsuka, S., Terasaki, K. and Miyoshi, T. (2019): Global Precipitation Forecasts by Merging Extrapolation-based Nowcast and Numerical Weather Prediction with Locally-optimized Weights. *Wea. and Forecasting*, 34, 701-714. doi: 10.1175/WAF-D-18-0164.1
- [20]. **Kotsuki, S.\***, Kurosawa, K., and Miyoshi, T. (2019): On the Properties of Ensemble Forecast Sensitivity to Observations. *Q. J. R. Meteorol. Soc.*, 145, 1897-1914. doi: 10.1002/qj.3534
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- [17]. **Kotsuki, S.\***, Terasaki, K., Yashiro, H., Tomita, H., Satoh, M. and Miyoshi, T. (2018): Online Model Parameter Estimation with Ensemble Data Assimilation in the Real Global Atmosphere: A Case with the Nonhydrostatic Icosahedral Atmospheric Model (NICAM) and the Global Satellite Mapping of Precipitation Data. *J. Geophys. Res.*, 123, 7375-7392. doi: 10.1029/2017JD028092
- [16]. Honda, T., **Kotsuki, S.**, Lien, G.-Y., Okamoto, K. and Miyoshi, T. (2018): Assimilation of Himawari-8 All-Sky Radiances Every 10 Minutes: Impact on Precipitation and Flood Risk Prediction. *J. Geophys. Res.*, 122, 1-12. doi:10.1002/2017JD027096
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- [1]. **Kotsuki, S.\***, and Tanaka, K. (2013): Long-term Water Balance Analysis Using Different Precipitation Products in Upper Chao Phraya River, Thailand. *Proceedings of 6th APHW conference*.

## **Invited Presentations**

- [14] **Kotsuki, S.**, Shiojiri, D., Ouyang, M., Muto, Y., and Kanemaru, K.: Improving Global Precipitation Estimates by Hydrological Land Data Assimilation. AMS Annual Meeting, January 11, 2023. (Jan. 11, Colorado Convention Center, Denver / online)
- [13] **Kotsuki, S.**, Ouyang, M., Saito, T. and Shiojiri, D.: Combining Data Assimilation and Sparse Sensing Placement Method For Designing Better Observing Networks. RIKEN Data Assimilation Seminar, September 14, 2022. (Sep. 14, online)
- [12] **Kotsuki, S.** and Ouyang, M.: Optimizing mobile observing placements for numerical weather prediction: Idealized experiments with a simplified AGCM. AOGS 2022, August 1-5, 2022. (Aug. 03, online)
- [11]. **Kotsuki, S.**, Terasaki, K., Satoh, M. and Miyoshi, T.: Ensemble-Based Data Assimilation of GPM DPR Reflectivity into the Nonhydrostatic Icosahedral Atmospheric Model NICAM. JpGU 2021, June 3-6, 2021 (June 3, online)
- [10]. **Kotsuki, S.**, Miyoshi, T., Kondo, K. and Potthast, R.: A Local Particle Filter and Its Gaussian Mixture Extension: Experiments with an Intermediate AGCM. RIKEN Data Assimilation Seminar, September 11, 2020, (Sep. 11, online)
- [9]. **Kotsuki, S.**, Pensoneault, A., Okazaki, A. and Miyoshi, T.: Weight Structure of the Local Ensemble Transform Kalman Filter: A Case with an Intermediate AGCM. JpGU-AGU Joint Meeting 2020, July 12-16, 2020. (July 13, Makuhari Messe, Chiba)
- [8]. **Kotsuki, S.**: Leading Research on Data Assimilation in Global Weather Prediction System. Topological Data Analysis Laboratory Seminar, Apr. 29, 2020. (Apr. 29, Kyoto-Univ., Zoom)
- [7]. **Kotsuki, S.**: Introduction of Data Assimilation and Its Techniques. Topological Data Analysis Laboratory Seminar, Apr. 29, 2020. (Apr. 29, Kyoto-Univ, on Zoom)
- [6]. **Kotsuki, S.**: Data Assimilation Research for Global Weather Prediction, The 7th International Symposium on Water Environmental Systems, Nov. 15, 2019 (Nov. 15, Tohoku University, Sendai)
- [5]. **Kotsuki, S.**: Leading Research on Data Assimilation in Global Weather Prediction System. Earth Science Department Seminar, Aug. 27, 2019. (Aug. 27, U. Melbourne, Melbourne)
- [4]. **Kotsuki, S.**: Improving Global Precipitation Forecasts using Satellite-derived Precipitation Data, NWP seminar Bureau of Meteorology, Aug. 17, 2019. (Aug. 17, Australian Bureau of Meteorology, Melbourne)
- [3]. **Kotsuki, S.**, and Miyoshi, T.: Diagnosing Observation Impacts and Error Covariance with NICAM-LETKF. LMU Data Assimilation Seminar, Jun. 18, 2019. (Jun. 18, Munich Univ., Munich)
- [2]. **Kotsuki, S.**, and Miyoshi, T.: Diagnosing Observation Impacts and Error Covariance with NICAM-LETKF. DWD NWP Seminar, Jun. 13, 2019. (Jun. 13, Deutscher Wetterdienst, Offenbach)

- [1]. **Kotsuki, S.**, Sato, Y., Terasaki, K., Yashiro, H., Tomita, H., Satoh, M. and Miyoshi, T.: Model Parameter Estimation with Data Assimilation using NICAM-LETKF. JpGU Meeting 2019, May 26-30, 2019. (May 29, Makuhari Messe, Chiba)

## **Appendix A: CV only in Japanese**

### **Publications: Peer-reviewed Articles in Japanese**

- [16]. 齋藤匠, 小槻峻司\*, Mao OUYANG, 塩尻大也 (2022): スパースセンサ最適化を用いた大次元力学系における有効な観測位置決定手法の開発. 水工学論文集, 78, 391-396. doi: [10.2208/jscejhe.78.2\\_I\\_391](https://doi.org/10.2208/jscejhe.78.2_I_391)
- [15]. 藤村健介, 小槻峻司\*, 山田真史, 塩尻大也, 渡部哲史 (2022): 降雨流出氾濫モデルのアンサンブルデータ同化安定化に関する研究. 水工学論文集, 78, 409-414. doi: [10.2208/jscejhe.78.2\\_I\\_409](https://doi.org/10.2208/jscejhe.78.2_I_409)
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- [13]. 赤塚洋介, 瀬戸里枝, 鼎信次郎, 小槻峻司, 渡部哲史 (2021): 豪雪地帯に位置するダム対象とした融雪期の操作における AI ダム操作モデルの応用可能性. 水工学論文集, 77, 109-114. doi:[10.2208/jscejhe.77.2\\_I\\_109](https://doi.org/10.2208/jscejhe.77.2_I_109)
- [12]. 小槻峻司\*, 桃井裕広, 菊地亮太, 渡部哲史, 山田真史, 阿部紫織, 綿貫翔 (2020): 回帰学習器のアンサンブル学習による降雨洪水氾濫モデル・エミュレータ. 水工学論文集, 76, 367-372. doi:[10.2208/jscejhe.76.2\\_I\\_367](https://doi.org/10.2208/jscejhe.76.2_I_367)
- [11]. 関本大晟, 渡部哲史, 小槻峻司, 山田真史, 阿部紫織, 綿貫翔 (2020): 降雨流出氾濫モデル・エミュレータによる浸水範囲予測. 水工学論文集, 76, 547-552. doi:[10.2208/jscejhe.76.2\\_I\\_547](https://doi.org/10.2208/jscejhe.76.2_I_547)
- [10]. 阿部紫織, 渡部哲史, 山田真史, 小槻峻司, 綿貫翔 (2019): 大規模気候予測情報を用いた浸水解析に降水量観測値と海面水温パターンが及ぼす影響. 水工学論文集, 75, 1081-1086. doi:[10.2208/jscejhe.75.2\\_I\\_1081](https://doi.org/10.2208/jscejhe.75.2_I_1081)
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### **Publications: Reports in Japanese**

- [7]. 小槻峻司, 寺崎康児, 新保明彦, 坂本雅巳, 藤田匡, 津口裕茂, 北畠尚子, 竹見哲也, 高藪縁, 金丸佳矢, 鼎信次郎, 中村尚, 富田浩文, 三好建正 (2019): 「平成 30 年 7 月豪雨に関する緊急対応研究会」の報告. 天気, 66(3), 253-259.
- [6]. 川畑拓矢, 上野玄太, 中野慎也, 藤井陽介, 三好建正, 小守信正, 増田周平, 茂木耕作, 小槻峻司, 澤田洋平, Peter Jan van Leeuwen, 長尾大道 (2019): 第 9 回データ同化ワークショップの報告. 天気, 66(2), 51-54.
- [5]. 川畑拓矢, 上野玄太, 中野慎也, 藤井陽介, 三好建正, 小守信正, 増田周平, 茂木耕作, 中村和幸, 杉本憲彦, 前島康光, Le Duc, 小槻峻司, 須藤明人, 杉浦望実, 釜堀弘隆 (2018): 第 8 回データ同化ワークショップの報告. 天気, 65(5), 22-25.



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### **Publications: Book Chapters in Japanese**

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### **Invited Presentations (in Japanese)**

- [18] 小槻峻司: A World Beyond Predictions: 気象制御実現への挑戦, 千葉大学/株式会社リコー包括連携 第二回包括連携協議会(講演会), 10/05, 2022. (Oct. 05, Online)
- [17] 小槻峻司: 大規模数値シミュレーションで切り開く豪雨・洪水予測研究, 第 35 回 JST 数学キャラバン in 京都, 07/29, 2022. (Jul. 29, Online)
- [16] 小槻峻司: 「観測の価値」を最大化するデータ同化・予測手法の開発, 異分野融合研究セミナー, 07/19, 2022. (Jul. 19, Online)
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- [9]. 小槻峻司: Local Ensemble Transform Kalman Filter: introduction and practical techniques. Mathematical Modelling Seminar, 12/22, 2020. (Dec. 22, Online)
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- [6]. 小槻峻司, 三好建正: 全球大気データ同化システムによる天気予報研究の最前線. 第 14 回名工大・核融合研合同セミナー, 07/18, 2019. (Jul. 18, 名工大 2 号館)
- [5]. 小槻峻司: 天気予報研究の最前線 -研究者は何に魅せられているか-. 阪神高速道路株式会社・堺建設部勉強会, 11/08, 2018. (Nov. 08, 阪神高速道路株式会社・堺建設部)
- [4]. 小槻峻司, 黒澤賢太, 三好建正: EFSO の現状と惑星気象研究への発展の可能性. 第 19 回惑星圏研究会, 02/27-03/01, 2018. (Feb 27, 東北大学・青葉サイエンスホール)
- [3]. 小槻峻司, 黒澤賢太, 三好建正: 全球大気データ同化システム NICAM-LETKF を使った EFSO 観測インパクト推定. 第 8 回データ同化ワークショップ, 01/19, 2018. (Jan 19, 明治大学中野キャンパス)
- [2]. 小槻峻司, 三好建正: 全球大気アンサンブルデータ同化システム NICAM-LETKF による衛星降水観測データ同化. 地震研特定共同研究(B)「データ同化」勉強会, 2017. (Jul 14, 東大地震研究所)
- [1]. 小槻峻司, 三好建正: 予測モデルのためのデータ同化. PSTEP 研究集会「太陽地球圏環境予測のためのモデル研究の展望」, 01/26-27, 2017. (Jan 27, 名古屋大学, 名古屋)

## 千葉大学 マル合審査

- [2]. 博士後期課程: マル合 (2021 年 07 月)
- [1]. 博士前期課程: マル合 博士後期課程: 合 (2019 年 12 月)

## 千葉大学大学院 融合理工学府 地球環境科学専攻 リモートセンシングコース 講義

- [3]. リモートセンシング特論 II (T1&T2; FY23)

- [2]. 地球観測社会システム (分担; T4&T5; FY20, 21, 22, 23)
- [1]. 地球環境科学専攻特別講義Ⅱ (分担; T1&T2; FY21, 22, 23)

### 千葉大学 工学部情報工学コース 講義

- [2]. 量子力学基礎(1) (T4&T5; FY20, 21, 22, 23)
- [1]. リモートセンシング工学 (分担; T4&T5; FY19, 20, 21, 22, 23)

### 千葉大学 環境リモートセンシング研究センター 委員会 (赤字: 委員長)

- [23]. 中期計画推進, 自己点検・評価, 計算機および DB, 環境 ISO 実行, 広報, 予算, 学術推進企画小
- [22]. 中期計画推進, 自己点検・評価, 計算機および DB, 環境 ISO 実行, 広報, 予算, 学術推進企画小
- [21]. 中期計画推進, 自己点検・評価, 計算機および DB, 環境 ISO 実行, 広報, 予算, 学術推進企画小
- [20]. 中期計画推進, 自己点検・評価, 計算機および DB, 環境 ISO 実行, 広報
- [19]. 中期計画推進, 自己点検・評価

予算委員長としての活動

- ・ HP リニューアル (<https://ceres.chiba-u.jp>)
- ・ 研究センター広報動画 (<https://www.youtube.com/watch?v=-hdzeJl3QCw>)
- ・ ロゴ作成 (<https://ceres.chiba-u.jp/ceres/logo>)

### 千葉大学大学院 融合理工学府 リモートセンシングコース 委員会

- [23]. 研究推進・広報社会連携委員会
- [22]. 研究推進・広報社会連携委員会

### 千葉大学 その他

- [23]. 千葉大学・工学研究院 リサーチ・ハブリーダー (研究院長特別補佐)
- [21, 22]. 科研費事前確認支援制度・支援教員

### Teaching Experiences (at RIKEN)

**Spring 2019**      Data Assimilation A, a graduate- and undergraduate-level introductory data assimilation course, Faculty of Science, Kyoto University

<b>Spring 2018</b>	Data Assimilation A, a graduate- and undergraduate-level introductory data assimilation course, Faculty of Science, Kyoto University
<b>Fall 2017</b>	Data Assimilation B, a graduate- and undergraduate-level advanced data assimilation course, Faculty of Science, Kyoto University
<b>Spring 2017</b>	Data Assimilation A, a graduate- and undergraduate-level introductory data assimilation course, Faculty of Science, Kyoto University
<b>Spring 2016</b>	Special Lecture on Mathematical Science: Data Assimilation, a graduate- and undergraduate-level introductory data assimilation course, Faculty of Science, Kyoto University
<b>September 2016</b>	iTHES School on Data Assimilation, RIKEN iTHES <a href="http://www.data-assimilation.riken.jp/jp/events/ithes_da_2016fall/">http://www.data-assimilation.riken.jp/jp/events/ithes_da_2016fall/</a>

### **Student Interns Supervised (at RIKEN)**

- [5]. Aulia Febianda Anwar Tinumbang, Kyoto University (RIKEN CCS internship program, 2018)
- [4]. Andrew Pensoneault, University of Iowa (RIKEN CCS internship program, 2018)
- [3]. Takuya Kurihana, University of Tsukuba (RIKEN AICS internship program, 2017)
- [2]. Taiga Shibata, University of the Ryukyus (RIKEN AICS internship program, 2017)
- [1]. Yaping Chang, University of Chinese Academy of Sciences (RIKEN International Program Associate, 2015)

## **Appendix-B: Publications: Peer-reviewed Articles in Japanese (English)**

- [16]. Saito, T., **Kotsuki, S.\***, Ouyang, M. and Shiojiri, D. (2022): Improving the data-driven sparse sensor placement method for large-dimensional dynamical systems. *Ann. J. Hydraulic Engineering*, XX, XX-XX. doi: [10.2208/jscejhe.XXXX](https://doi.org/10.2208/jscejhe.XXXX) (in press)
- [15]. Fujimura, K., **Kotsuki, S.\***, Yamada, M., Shiojiri, D. and Watanabe, S. (2022): Exploring appropriate inflation and localization methods to stabilize ensemble data assimilation of a rainfall-runoff-inundation mode. *Ann. J. Hydraulic Engineering*, XX, XX-XX. doi: [10.2208/jscejhe.XXXX](https://doi.org/10.2208/jscejhe.XXXX) (in press)
- [14]. Shiojiri, D., **Kotsuki, S.**, Saito, T., and Ouyang, M. (2022): Investigating effective rain gauge locations through the data-driven sparse sensor placement method. *Ann. J. Hydraulic Engineering*, XX, XX-XX. doi: [10.2208/jscejhe.XXXX](https://doi.org/10.2208/jscejhe.XXXX) (in press)
- [13]. Akatsuka, Y., Seto, R., Kanae, S., **Kotsuki, S.** and Watanabe, S. (2021): A study on the applicability of AI dam operation model in snowmelt season for dams in heavy snowfall area. *Ann. J. Hydraulic Engineering*, 77, 109-114. doi:[10.2208/jscejhe.77.2\\_I\\_109](https://doi.org/10.2208/jscejhe.77.2_I_109)
- [12]. **Kotsuki, S.\***, Momoi, M., Kikuchi, R, Watanabe, S., Yamada, M., Abe, S., and Watanuki A. (2020): Emulating rainfall-runoff-inundation model through ensemble learning of multiple regularized regressors. *Ann. J. Hydraulic Engineering*, 76, 367-372. doi:[10.2208/jscejhe.76.2\\_I\\_367](https://doi.org/10.2208/jscejhe.76.2_I_367)
- [11]. Sekimoto, T., Watanabe, S., **Kotsuki, S.**, Yamada, M., Abe, S. and Watanuki, A. (2020): Predicting flood inundation area by rainfall-runoff-inundation model emulator. *Ann. J. Hydraulic Engineering*, 76, 547-552. doi:[10.2208/jscejhe.76.2\\_I\\_547](https://doi.org/10.2208/jscejhe.76.2_I_547)
- [10]. Abe, S., Watanabe, S., Yamada, M., **Kotsuki, S.** and Watanuki, A. (2019): Impact on observed rainfall and patterns of sea surface temperature on flood analysis using massive climate prediction data. *Ann. J. Hydraulic Engineering*, 75, 1081-1086. doi:[10.2208/jscejhe.75.2\\_I\\_1081](https://doi.org/10.2208/jscejhe.75.2_I_1081)
- [9]. Tanaka, T., Watanabe, S., **Kotsuki, S.**, and Coauthors (2018): Frontiers in hydrology and water resources research - WACCA generation's challenges. *J. Japan Soc. Hydrol. Wat. Resour.*, 31(6), 509-540. doi: [10.3178/jjshwr.31.509](https://doi.org/10.3178/jjshwr.31.509)
- [8]. **Kotsuki, S.\***, and Tanaka, K. (2014): Improvement of global crop calendar product using satellite-sensed vegetation indexes. *Ann. J. Hydraulic Engineering*, 70(4), 259-264. doi: [10.2208/jscejhe.70.I\\_259](https://doi.org/10.2208/jscejhe.70.I_259)
- [7]. **Kotsuki, S.\***, Tanaka, K. and Kojiri, T. (2013): Estimation of climate change impact on Japanese water resources Part II: Water demand–supply balance, rice yield changes, and an adaptation plan, *J. Japan Soc. Hydrol. Wat. Resour.*, 26, 143-152. doi: [10.3178/jjshwr.26.143](https://doi.org/10.3178/jjshwr.26.143)
- [6]. **Kotsuki, S.\***, Tanaka, K. and Kojiri, T. (2013): Estimation of climate change impact on Japanese water resources: Part I The development of a Japanese water resource model, *J. Japan Soc. Hydrol. Wat. Resour.*, 26, 133-142. doi: [10.3178/jjshwr.26.133](https://doi.org/10.3178/jjshwr.26.133)
- [5]. **Kotsuki, S.\***, Tanaka, K. and Kojiri, T. (2013): An estimation of global agricultural water demand including spatial distribution of crop species. *Environ. Sci.*, 26(2), 158-166. doi: [10.11353/sesj.26.158](https://doi.org/10.11353/sesj.26.158)
- [4]. **Kotsuki, S.\***, and Tanaka, K. (2013): Estimating vapor supply from irrigated cropland using hydrological land surface model and atmospheric water balance method. *Ann. J. Hydraulic Engineering*, 69, 1801-1806. doi: [10.2208/jscejhe.69.I\\_1801](https://doi.org/10.2208/jscejhe.69.I_1801)

- [3]. **Kotsuki, S.\*** Tanaka, K., Kojiri, T. and Hamaguchi, T. (2012): Simulation of global water cycle in land using a crop calendar specified by phenological analysis of NDVI. *J. Japan Soc. Hydrol. Wat. Resourc.*, 25, 373-388. doi: [10.3178/jjshwr.25.373](https://doi.org/10.3178/jjshwr.25.373)
- [2]. **Kotsuki, S.\*** Tanaka, K., Kojiri, T. and Hamaguchi, T. (2012): Parameter identification of distributed runoff model using the particle swarm optimization method. *Ann. J. Hydraulic Engineering*, 68, 523-528. doi: [10.2208/jscejhe.68.I\\_523](https://doi.org/10.2208/jscejhe.68.I_523)
- [1]. **Kotsuki, S.\*** Tanaka, K., Kojiri, T. and Hamaguchi, T. (2011): Development of water circulation model including irrigation. *Ann. J. Hydraulic Engineering*, 55, 553-558. doi:[10.2208/jscejhe.67.I\\_553](https://doi.org/10.2208/jscejhe.67.I_553)

水工学論文集 → *Ann. J. Hydraulic Engineering*

水文・水資源学会誌 → *J. Japan Soc. Hydrol. Wat. Resourc.*

環境科学会誌 → *Environ. Sci.*