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Ken Hirata

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SEEC Building, Room N227, 4001 Discovery Drive, Boulder, CO 80303

Education

University of Colorado Boulder, Boulder, CO, USA — Jun 2022 – Present
Pursuing a PhD degree, Department of Atmospheric and Oceanic Sciences

Hokkaido University, Sapporo, Japan — Apr 2018 – Mar 2022
Bachelor's degree, Department of Earth and Planetary Sciences, School of Science

- GPA 4.16/4.3
- Nitobe College Summa Cum Laude - Representative of the Nitobe graduates
- School of Science Alumni Association Award

Research Experience

Deriving Aerosol Radiative Effects using Observations and LES — Aug 2022 – Present
University of Colorado Boulder

- Advisor: Sebastian Schmidt
- Using high-resolution atmospheric model outputs constrained by various observations to derive radiative effects

Cloud Tomography based on Airborne Imagery — Jun 2022 – Present
University of Colorado Boulder

- Advisor: Sebastian Schmidt
- Applying an algorithm of passive tomography for non-synthetic in-situ measurement of radiometric data

Development of a Three-Dimensional Radiative Transfer Code — Apr 2021 – Present
Hokkaido University

- Advisor: Masaru Inatsu and Yousuke Sato
- Developing an efficient 3D radiative transfer code that is compatible with parallel computing and applicable to high-resolution atmospheric models

Reproducing RCE Experiments in the Past — Apr 2020 – Mar 2021
Hokkaido University

- Advisors: Masaru Inatsu and Miho Sekiguchi (Tokyo University of Marine Science and Technology)
- Reproduced a series of radiative convective equilibrium experiments conducted by Dr. Syukuro Manabe based on his papers and references in the 1960s

Cloud 3D Modelling by Photogrammetry — Jun 2016 – Sep 2017
Global Science Campus, Hokkaido University

- Advisor: Yukihiro Takahashi
- Developed a low-cost ground-based method to monitor developing clouds based on photogrammetry

Publications

1. **Hirata, K.**, Sekiguchi, M., Sato, Y., & Inatsu, M. (2023). Biases in Shortwave Three-Dimensional Radiative Transfer Calculations for High-Resolution Numerical Models. *SOLA*, **19**, 50-56.

Conference Presentations

9. **Ken Hirata**, Konrad Sebastian Schmidt, Hong Chen, and Jake J. Gristey, 2023. Quantifying Aerosol Radiative Effects in Heterogeneous Atmosphere using Observations and Atmospheric Models. AGU Annual Meeting 2023, Dec 12, 2023, San Francisco, CA, USA.

8. **Ken Hirata**, Miho Sekiguchi, and Yousuke Sato, 2023. Improving Representation of Scattered Radiation in Three-Dimensional Radiative Transfer Calculations for High-Resolution Numerical Models. The 6th International Workshop on Nonhydrostatic Models (NHM-WS 2023), Sep 1, 2023, Sapporo, Japan.

7. **Ken Hirata**, Konrad Sebastian Schmidt, Hong Chen, and Jake J. Gristey, 2023. Optical and Radiative Closure while Deriving Aerosol Radiative Effects in the Vicinity of Clouds. Workshop Lille 2023 & GRASP ACE Summer School, May 24, 2023, Lille, France.

6. **Ken Hirata**, Miho Sekiguchi, Yousuke Sato, and Masaru Inatsu, 2022. The Development of an Extensible Three-Dimensional Radiative Transfer Model. International Radiation Symposium 2022, July 5, 2022, Thessaloniki, Greece.

5. **Ken Hirata**, Masaru Inatsu, and Miho Sekiguchi, 2021. Toward the Development of Three-Dimensional Radiative Transfer Model. Workshop no.1, Hokkaido Division, Meteorological Society of Japan, 2021, July 15, 2021, Online.

4. **Ken Hirata**, Masaru Inatsu, and Miho Sekiguchi, 2020. Towards Re-experiment of Manabe and Möller, 1961 (1): Absorption of Longwave and Solar Radiation. Workshop no.1, Hokkaido Division, Meteorological Society of Japan, 2020, December 23, 2020, Online. [**Presentation Award**]

3. Maya Shimono, **Ken Hirata**, Kuriki Murahashi, Ade Purwanto, Hiroshi Kawamata, Nobuyasu Naruse, and Yukihiro Takahashi, 2017. Measurements of Clouds Using 3D models Generated from Images Captured with Uncalibrated Cameras. EMS Annual Meeting: European Conference for Applied Meteorology and Climatology 2017, September 6, 2017, Dublin, Ireland.

2. Maya Shimono, **Ken Hirata**, Kuriki Murahashi, Ade Purwanto, Hiroshi Kawamata, Nobuyasu Naruse, Yukihiro Takahashi, 2017. Analysis of Optimal Conditions for Photo-based 3D Modeling of Cloud-like Objects. JpGU-AGU Joint Meeting 2017, May 22, 2017, Chiba, Japan.

1. **Ken Hirata**, Maya Shimono, Kuriki Murahashi, Ade Purwanto, Hiroshi Kawamata, Nobuyasu Naruse, Yukihiro Takahashi, 2017. Cloud Observation by 3D Modeling Based on Camera Images. JpGU-AGU Joint Meeting 2017, May 22, 2017, Chiba, Japan.

Teaching and Mentoring

ATOC 4815/5815 Scientific Programming, Data Analysis and Visualization Laboratory, University of Colorado Boulder | *Grader* Fall 2023

- Graded assignments, taught two lectures, and co-hosted office hours for 17 students.

ATOC REU, University of Colorado Boulder | *Graduate student mentor* Summer 2023

- Mentored a third-year undergraduate student in his summer research project in long-term biases of climate simulations.

Exercises in Information Sciences, Hokkaido University | *Teaching Assistant* 1st Semester 2020

- Made lecture materials, graded assignments, and gave feedback/tips to 20 students

Honors

Funai Overseas Scholarship Aug 2022 - Jul 2024

- Merit-based scholarship covering two full years of tuition, health insurance and a monthly stipend for the PhD program (about $160,000 in total)

School of Science Alumni Association Awards, Hokkaido University Mar 2022

- Was awarded a title of having the most promising future prospect among the graduates of the department

Professional Experience

Graduate Research Assistant, University of Colorado Boulder — Jun 2022 - Aug 2022

Contract Employee, Japan Weather Association — Mar 2022 - Apr 2022

- Developed codes to visualize meteorological data and created a method to detect snowfall using roadside camera images

Skills

Languages: English (Fluent, TOEFL iBT 107, IELTS 8.5, CEFR C2), Japanese (Native)
Programming Languages: Python, Fortran 90 (with MPI), C++, Shell Script, HTML/CSS/JavaScript
Others: Soldering, Analog Circuit Design