2019 CFMIP Meeting on Clouds, Precipitation, Circulation, and Climate Sensitivity

Sep. 30 to Oct. 4, 2019 at the St. John Hotel, Mykonos, Greece

Agenda

Monday, September 30th

10:00 – 11:00am - Registration

Welcome Session

11:00 – 11:30am – Welcome, logistics, local host presentation – Vasso Kotroni, Kostas Lagouvardos, George Tselioudis
11:30 –11:45am – State of CFMIP – George Tselioudis, Masahiro Watanabe
11:45 – 12:00pm – Introduction of CLIVAR Climate Dynamics Panel (CDP) – TBD

2:00pm - Excursion to Delos (Optional)

6:00pm – Welcome reception

Tuesday, October 1st

Session 1: Forcing, Feedbacks and Climate Sensitivity in CMIP5 and CMIP6

9:00 – 9:15am - Climate feedbacks in the WCRP assessment on climate sensitivity – *Steve Klein*
9:15 – 9:30am - A preliminary assessment of forcing, feedbacks, and climate sensitivity in CMIP6 – *Mark Zelinka*
9:30 – 9:45am - Synthesizing CFMIP experiments to understand CESM2's high climate sensitivity – *Brian Medeiros*
9:45 – 10:00am - A physical mechanism for the relationship between climate sensitivity, low-level cloud feedback and double-ITCZ bias – Mark Webb
10:00 – 10:15am - Are cloud feedbacks linear with carbon dioxide forcing? – Jen Kay
10:15 – 10:30am - The cloud response to ENSO variability: mechanisms and implications for constraining climate sensitivity – *Cristian Proistosescu*

10:30 – 11:00am Coffee Break (Poster I posters up)

Session 1 continued

11:00 – 11:15am - The forced and unforced pattern effects in a large model ensemble – *Andrew Dessler*
11:15 – 11:30pm - Clouds and sensitivities across a hierarchy of GFDL models - *Levi Silvers*
11:30 – 11:45am - Low-level cloud response to global warming in CMIP6 models – *Anna Lea Albright*
11:45 – 12:00pm - Hadley cell expansion, Southern Ocean cloud radiative effect variability, and climate sensitivity in CMIP6 models – *George Tselioudis*
12:00 – 12:30pm – Discussion on Feedbacks and Climate sensitivity

12:30 – 2:00pm Lunch

2:00 – 3:00pm – Poster Session I

Session 2: State- and Time-Dependence of Climate Feedbacks

3:00 - 3:15am - Inter-model spread in CMIP5 feedback kinkiness traced to surface warming patterns – *Yue Dong*
3:15 – 3:30am - Tropical Pacific SST pattern changes in observations and models: How can we reconcile? – *Masahiro Watanabe*
3:30 – 3:45pm - Equilibrium Climate Sensitivity is Sensitive to Changes in Poleward Ocean Heat Transport – *Hansi Singh*
3:45 – 4:00pm - Limitations of the Green's function approach to analyzing spatial radiative feedbacks – *Jonah Bloch-Johnson*

4:00 – 4:30pm – Coffee break

4:30 – 4:45pm - Climate feedback strength: no historical period pattern effect when using HadISST data – *Nicholas Lewis*
4:45 – 5:00am - Equilibrium and transient state dependencies of climate sensitivity: are they important for climate projections? – *Olivier Geoffroy*
5:00 – 5:15pm - Decomposing atmospheric temperature response to CO2 at process level – *Yi Huang*
5:15 – 5:30pm - Radiative budget constraint on rapid adjustments of precipitation and clouds to increasing CO2 – *Tra Dinh*
5:30 – 6:00pm Discussion on Space- and Time-Dependence of Climate Feedbacks

Wednesday, October 2nd

Session 3: Convective Processes and Radiative Convective Equilibrium

9:00 – 9:15am - Observed modulation of the tropical radiation budget by convective organization and lower-tropospheric stability – *Sandrine Bony*

9:15 – 9:30am - Tropical high cloud–convection feedbacks in the Earth System – *Graeme Stephens*
9:30 – 9:45am - Impact of convective self-aggregation on tropical precipitation extremes – *Caroline Muller*
9:45 – 10:00am - Convective aggregation and precipitation extremes – *Brian Soden*
10:00 – 10:15am - What drives the lifecycle of tropical anvil clouds? – *Blaž Gasparini*
10:15 – 10:30am - Fixed anvil temperature feedback - positive, zero or negative? – *Masakazu Yoshimori*

10:30 – 11:00am Coffee Break

Session 3 continued

11:00 – 11:15am - Tropical clouds and convection in RCE simulations – *Allison Wing*
11:15 – 11:30am - Climate sensitivity across the RCEMIP simulations – *Tobias Becker*
11:30 – 11:45pm - Is the net cloud radiative effect over the tropical warm pools constrained to be near-zero? – *Casey Wall*
11:45 – 12:00pm – Observation of the stability-iris effect with Calipso – *Marion Saint-Lu*
12:00 – 12:30pm – Discussion on Convective Processes and RCE framework

12:30 – 2:00pm Lunch

Session 4: Coupling of Clouds with Atmospheric and Oceanic Circulation

2:00 – 2:15pm - The basic effect of cloud radiative effects on tropical sea-surface temperature variability – *Dave Thompson*
2:15 – 2:30pm - The influence of cloud radiative effects on extratropical-tropical and inter-basin teleconnection – *Yen-Ting Hwang*
2:30 – 2:45pm - Equatorial warming dominated by off-equatorial forcing – *Malte Stuecker*
2:45 – 3:00pm - Constraining the extent of solstitial Hadley cells in a wide range of climates and configurations – *Simona Bordoni*

3:00 – 3:30pm Coffee Break (Poster II posters up)

3:30 – 3:45pm - ITCZ-MIP: Understanding ITCZ width and its impacts on climate and circulation – Angie Pendergrass
3:45 – 4:00pm - Tightening of tropical ascent in observations and models – *Hui Su*
4:00 – 4:15pm - Subpolar radiative forcing in each hemisphere causes distinct tropical climate responses – *Sarah Kang*
4:15 – 4:30pm - On the remote impact of Southern Ocean cooling – *Xiyue Zhang*
4:30 – 4:45pm - Climatic impact and feedback response of mesoscale cellular convective clouds – *Isabel McCoy*
4:45 – 5:00pm - Changes of clouds and large-scale circulations due to global warming in multi-decadal global nonhydrostatic simulations – *Akira Noda*
5:00 – 5:30pm Discussion on Coupling of Clouds and Circulation

7:00pm Conference Dinner (Optional)

Thursday , October 3rd

Session 5: Extratropical Cloud Processes and Feedbacks

9:00 – 9:15am - Understanding the meteorological controls on the Arctic low cloud annual cycle: Implications for Arctic cloud feedback – *Patrick Taylor*
9:15 – 9:30am - Isolating the influence of cloud radiative feedbacks on Arctic amplification through cloud-locking – *Eleanor Middlemas*
9:30 – 9:45am - The role of global versus regional cloud-radiative changes on the global warming response of the mid-latitude jet streams – *Nicole Albern*
9:45 – 10:00am - As cold clouds warm, their lifetime increases: a negative feedback underestimated in GCMs – *Johannes Mülmenstädt*
10:00 – 10:15am - Cloud controlling factors in the midlatitudes across cyclonic and anticyclonic regimes – *Daniel McCoy*
10:15 – 10:30am Discussion on Extratropical Cloud Processes and Feedbacks

10:30 – 11:00am Coffee Break

Session 6: Precipitation and Hydrological Sensitivity

11:00 – 11:15am – Understanding changes in regional precipitation variability across multiple timescales – *Rob Chadwick*
11:15 – 11:30am – Can climate models simulate the atmospheric heat budget and does it matter? – *Christian Jakob*
11:30 – 11:45am - Precipitation efficiency: A linchpin for model analysis, development and observational constraints? – *Yi Ming*
11:45 – 12:00pm - Cloud regimes and relation to precipitation globally and over the Mediterranean region – *Dimitra Konsta*
12:00 – 12:15pm - Physical constraints and modeling uncertainties in the intensification of the global hydrologic cycle – *Benjamin Fildier*
12:15 – 12:30pm – Discussion on Precipitation and Hydrologic Sensitivity

12:30 – 2:00pm Lunch

2:00 – 3:00pm Poster Session II

Session 7: Observations and Model Evaluation for Process-level Understanding

3:00 – 3:15pm - Diurnal variations of clouds and water vapor profiles observed across the tropics with recent satellites, comparison with climate models – *Hélène Chepfer*
3:15 – 3:30pm - Shallow cumulus and stratocumulus cloud feedbacks inferred from CALIPSO and CloudSat observations – *Gregory Cesana*

3:30 – 3:45pm - Using CERES observations to assess CMIP6 climate model simulations of changes in Earth's radiation budget during and after the global warming "hiatus" – *Norm Loeb*
3:45 – 4:00pm - Observed radiative flux changes during the A-Train satellite era – *Ryan Kramer*

4:00 – 4:30pm Coffee Break

4:30 – 4:45pm - Distribution and covariation of water vapor and clouds in the trades – *Ann Kristin Naumann*

4:45 – 5:00pm - Climatological controls on the response of tropical clouds and relative humidity to greenhouse gas forcing – *Stephen Po-Chedley*
5:00 – 5:30pm Discussion on Observations and Model Evaluation

Friday, October 4th

Session 8: Low Cloud Processes, Feedbacks, and Adjustments

9:00 – 9:15am - Regionally resolved, observationally constrained marine low cloud feedbacks – *Tim Myers*
9:15 – 9:30am - Trade-wind cumulus cloud feedback in the ICON large eddy model (LEM) – bridging the gap to cloud resolving models – *Thorsten Mauritsen*
9:30 – 9:45am - Object-oriented identification of coherent structures: A multi-case analysis of boundary-layer Large-Eddy Simulations – *Florent Brient*
9:45 – 10:00am - Investigating the role of stratocumulus to cumulus transitions in the extratropical cloud optical depth feedback – *Ivy Tan*
10:00 – 10:15am – Substantial cloud brightening from shipping in subtropical low clouds – *Rob Wood*

10:15 – 10:45am Coffee Break

Session 8 continued

10:45 – 11:00am - A detailed look at the cumulus-valve mechanism and its potential implications for cloud-base cloudiness – *Raphaela Vogel*
11:00 – 11:15am - Improving the consistency between vertical subgrid-scale heterogeneity and cloud overlap parameterizations for low-level clouds in GCMs and RCMs – *Jean-Louis Dufresne*
11:15 – 11:45am Discussion on Low Cloud Processes, Feedbacks, and Adjustments

11:45 – 1:00pm Discussion on CFMIP Future Plans, including informal MIP reports

Poster Session I

The role of dynamic and thermodynamic processes for the propagation of organized convection in a large-scale flow - *Ann Kristin Naumann*

A Study of Cloud Radiative Effect in Model Simulated MJO using Fully Closed Moist Static Energy Budget - *Ming Zhao*

The variability of clouds and water vapor in CMIP6 models - *Axel Lauer*

Impact of varying vertical resolution on cloud feedback in MOHC's CMIP6 GCM - *William Ingram*

Cloud anomalies associated with the North Atlantic Oscillation and their role for the short-term NAO dynamics - *Georgios Papavasileiou*

Cold pool collisions and its role in convective organization - *Bettina Meyer*

How do ocean warm anomalies favor the aggregation of deep convective clouds? - *Sara Shamekh*

Can low cloud feedback be explained based on low cloud indices? - *Tsuyoshi Koshiro*

Surface Warming Pattern, Cloud Radiative Effects and the Inconstancy of Climate Feedback Parameter - *Diego Jimenez de la Cuesta Otero*

The lightness of water vapor can stabilize Earth's climate - *Da Yang*

Differences in convection over warmer and cooler tropical oceans associated with climate sensitivity in CMIP5 - *Nagio Hirota*

Examining the sensitivity of low cloud mesoscale morphology to environmental variables - *Tianle Yuan*

Using a Neural Network model for feedback assessment - *Yi Huang*

Enhanced Oceanic Dynamical Control on Atlantic SST with Absence of Pacific mode Variability - *Aixue Hu*

Model-dependent cloud radiative kernels: derivations and applications - Xianglei Huang

The spread of climate states in CMIP5 and its links to atmospheric convective types - *David Fuchs*

Attribution of Earth’s energy imbalance to changes in radiative forcings and feedbacks - *Chen Zhou*

The impact of the zonal clustering of convection on the tropical large-scale climate - *Max Popp*

Evaluating the bulk mass-flux approach for shallow convective momentum transport and its impact on near-surface winds - *Beatrice Saggiorato*

Seasonal and interannual variations of the Intertropical Convergence Zone in the Indian Ocean – *Omid Alizadeh*

The Impacts of Bias in cloud-radiation-precipitation-circulation coupling on Pacific Seasonal and El Niño Simulations in Contemporary GCMs – *Juilin Li*

CMIP6 Climate Model Improvements in Clouds and Water Vapor Simulations - *Jonathan Jiang*

Forecastability between clouds and circulation - *Sylvia C Sullivan*

Diversity of the wintertime Arctic Oscillation pattern among CMIP5 models: Role of the stratospheric polar vortex - *Lin Wang*

Identifying the Sources of Memory in Large-Eddy Model simulations of the Diurnal Cycle of Deep Convection - *Chimene Laure Daleu*

Tropopause instability the real driver for climate change viewed through cosmogenic radioisotopes - *Lucrezia Terzi*

Understanding cloud feedback by comparing two cloud macrophysical schemes - *Yi Qin*

Convective Heating Leads to Self-Aggregation by Generating Available Potential Energy - *Da Yang*

Exploring uncertainty in model representation of atmospheric convection through Universal Structural Parameterisation - *Hugo Lambert*

Observed and Simulated Influence of SST on the Tropical Atmospheric Water Cycle - *Erik Höjgård-Olsen*

Improving the short-wave radiation biases in climate models - *Vidya Varma*

The effect of convective momentum transport on tropical cyclones - *Paul Vaillancourt*

The tropical temperatures of the Last Glacial Maximum as an emergent constraint of climate sensitivity in a Bayesian framework - *Martin Renoult*

Sensitivity Study of High-cloud Property Responses to Sea Surface Temperature Change Using a Global Nonhydrostatic Model - *Tomoki Ohno*

Review of heat flows in the Gulf of Mexico - *Miriam Alin Calva*

Role of interactive ocean and diurnal cycle in the clustering of deep convection – Adrian Tompkins

A WRF SCM testbed for GCM parameterisations - *Steve Sherwood*

ENSO variability in satellite observations and climate models - *Ulrika Willén*

What is the fate of detrained ice in the tropical western Pacific? - *Blaž Gasparini*

Poster Session II

Coupling of clouds and atmospheric relative humidity over the tropical oceans: insight from multi-satellites observations – *Helene Brogniez*

The Cumulus and Stratocumulus CloudSat-CALIPSO Dataset (CASCCAD) - *Gregory Cesana*

A New Convective Trigger for Better Capturing the Diurnal Cycle of Precipitation in Weather and Climate Models: Observational Evidence and Modeling Results - *Shaocheng Xie*

Nonlinear response of extreme precipitation to warming in CESM1 - *Angeline Pendergrass*

Using paleoclimates to narrow down on mixed phase cloud feedbacks - *Navjit Sagoo*

Significance of precipitation process in determining the aerosol indirect forcing - *Kentaroh Suzuki*

Evaluation of AGCM cloudiness and radiative effects using cloud vertical structures - *Lazaros Oreopoulos*

A new perspective on the equatorial Atlantic seasonal cycle - *Noel Keenlyside*

Global Marine Low Cloud-Radiative Sensitivity to Perturbations in the Large-Scale Environment - *Ryan Scott*

Diurnal cycles of precipitation and lightning in the tropics observed by TRMM3G68, LIS and WWLLN - *Shoshiro Minobe*

On the relationship between precipitation extremes and convective organization - *Addisu Semie*

Aerosol-cloud adjustments hidden beneath scavenging - *Daniel McCoy*

Impact of ESA CCI SST dataset on cloud regimes in atmosphere-only simulations at two horizontal resolutions - *Yoko Tsushima*

Estimating the shallow convective mass flux from the sub-cloud layer mass budget - *Raphaela Vogel*

Environmental Challenges and Hydrological Hazards: a Case Study of Alaknanda River Basin, Uttarakhand, India - *Bindhy Wasini Pandey*

Atmospheric ocean patterns associated with meteorological droughts in the southern Andes of Peru- *Breat Sheylla*

Climate Change Adaptation and Cloud Vulnerability Assessment, a case Study of Lesser Himalaya - *Bindhy Wasini Pandey*

Earth's Energy Imbalance of the Second Kind - *Miklos Zagoni*

Convective and large-scale precipitation in models - *Hideaki Kawai*

Automatic Lidar and Ceilometer Framework (ALCF) - *Peter Kuma*

Multi-Model Climate Vulnerability, Impacts and Adaptation Assessments of ENSO events in the Guinea-of-Guinea – *Samuel Olumide Akande*

Artificial intelligence-based models for Climate Change and Urban Sprawl Impacts on Coastal Degradation in West Africa – *Olajumoke Folasade Jejelola*

The Role of Thermodynamic Phase Shifts in Cloud Optical Depth Variations With Temperature – *Ivy Tan*

Thunderstorm Dynamics and Cloud Microphysics during Pre-monsoon over Western India - *Gurunath R Chinthalu*

Vertical Correlations of Water Vapor in Climate Models—A Revisit - *De-Zheng Sun*

Comparison of Observed & Modeled Top of the Atmosphere Intensities - *William van Wijngaarden*

A comprehensive study of characteristics and vulnerability power of Tropical Cyclone in the Bay of Bengal (13 031’ N, 870 32’E) and the Arabian Sea (15055’N, 63054’E) in 2018 and the possible solar linkage with them. - *Dhruba Banerjee*

Evaluation of Clouds in the E3SM Atmosphere Model Version 1 with Satellite Simulators - Yuying Zhang

Impact of Turbulence Parameterization on Global Low Level Cloud Feedbacks - *Clare Flynn*

AIRS Obs4MIPs V2 Dataset and CMIP6 Model Temperature and Humidity Biases - *Baijun Tian*

The Sensitivity of Tropical Extreme Precipitation to Warming in a Nonhydrostatic Model - *Alejandro Uribe*

Extreme precipitation events are more frequent and more intense over Jeddah, Saudi Arabia. Are shifting weather regimes the cause? - *Thang Luong*

A new method for understanding inter-model difference in low cloud feedback - *Tomoo Ogura*

The impact of shallow convection on boundary layer winds in ICON-LEM hindcasts over the North Atlantic - *Kevin Helfer*

Updates & Trends in COSP CloudSat and MISR Observational Datasets - *Roj Marchand*

Analysis of cloud structure dynamics during cloud burst events over India - *Payoshni Samantray*

A New Cloud Climate Dataset - *Dave Winker*

At what model resolution does Scu-top entrainment become reasonable - *Johannes Mülmenstädt*

Response of resolved polar cloud to idealized climate change - *Xiyue Zhang*

Timescales of precipitation response to CO2 forcing – *Paulo Ceppi*