2024 CFMIP/CLIVAR Meeting on Clouds, Circulation and Climate

Hosted at Boston College June 3-6, 2024; Last updated: June 4, 2024 (v12)

Program Notes:

1) *Plan for 12-minute talks leaving 3-minutes for questions. Please save your slides as PDF.*
2) *Posters dimensions are 30x40 inches. Poster session assignments are not thematic.*
3) *Breakout discussion sessions may include invited presentations.*

Monday June 3

10am-12:30 pm – Registration (245 Beacon St, 1st floor atrium)
11am-12pm – Lunch (Lyons Dining Hall)

Welcome 245 Beacon St, Rm 107
12:30-12:45 – Logistics Welcome from the Local Organizers
12:45-1:00 – Science Welcome CFMIP/CLIVAR Committees

Session #1: Climate sensitivity and feedbacks (245 Beacon St, Rm 107)
Chairs: Jen Kay and George Tselioudis
1:00-1:15 - Implications of a pervasive climate model bias for low-cloud feedback, Paulo Ceppi
1:15-1:30 - An observational estimate of the "pattern effect" on climate sensitivity, Dave Thompson*, Maria Rugenstein
1:30-1:45 - Impact of state-dependent forcings and feedbacks on projections of warming under SSP scenarios, Jonah Bloch-Johnson
1:45-2:00 - Radiative Feedbacks in CO2 removal scenarios, Ivan Mitevski
2:00-2:15 - Paleoclimate Pattern Effects and Revised Estimates of Modern-day Climate Sensitivity, Vincent Cooper
2:15-2:30 - discussion

2:30-3:00 pm - Coffee/Tea/Treats Break

Session #2: Climate sensitivity and feedbacks (245 Beacon St, Rm 107)
Chairs: Yi Ming and Clare Singer
3:00-3:15 - An observational estimate of short-term longwave high cloud feedbacks on a global scale, Juliet Pilewskie
3:15-3:30 - On the Relationship between Cloud Biases in AMIP Simulations and Cloud Feedbacks: An Emergent Constraint Analysis using the MISR Simulator, Roj Marchand*, Travis Aerenson
3:30-3:45 - Understanding the tropical high-cloud feedback through the ice-water-path lens, Jakob Deutloff
3:45-4:00 - Convection amplifies subtropical cloud feedback via surface turbulent fluxes in HadGEM3-GC3.1-LL., Mark Webb
4:00-4:15 - Climate Sensitivity and Relative Humidity Changes in Global Storm-Resolving Model Simulations of Climate Change, Timothy M. Merlis

4:15-4:30 - discussion

4:30-6:30 pm - Poster Session #1 (245 Beacon St, TBD)

6:30 pm Welcome Reception (Gasson Hall, Rm 100)

Tuesday June 4

8-9am – Breakfast (245 Beacon St, 1st floor atrium)

Session #3: Energy Imbalance (245 Beacon St, Rm 107)
Chairs: Yoko Tsushima and Mark Zelinka
9:00-9:15 - Consistency of Earth energy imbalance across observational platforms: moving beyond the global mean, Aaron Donohoe
9:15-9:30 - Current uncertainty in Earth energy imbalance mean trend and variability and challenges for improved long-term monitoring, Benoit Meyssinac
9:30-9:45 - Risk and Impact of a Data Gap in the Earth Radiation Budget Satellite Climate Data Record, Norman Loeb
9:45-10:00 - Improving the comparisons between models and observations in the CERES period, Gavin Schmidt
10:00-10:15 - Oceanic cloud trends during the satellite era and their radiative effects, George Tselioudis
10:15-10:30 - discussion

10:30-11:00 - Coffee/Tea Break

11:00-12:30 - Breakout discussion session #1 (245 Beacon St)

1) **Rm 107** Long-term radiative flux monitoring (led by Yoko Tsushima and Thorsten Mauritsen)
2) **Rm 102** Constraining cloud processes using observations: Are models getting better and how would we know? (led by Ivy Tan and Johannes Mulmenstadt)
3) **Rm 125** Mechanisms behind tropical warming patterns including machine learning, GFMIP etc. (led by Sarah Kang and Yen-Ting Hwang)

12:30pm – Group Photo (245 Beacon St, Rm 107)

12:30-2:00 – Lunch (Lyons Dining Hall)

Session #4: Warm Cloud Processes (245 Beacon St, Rm 107)
Chairs: Paulo Ceppi and Brian Medeiros
2:00-2:15 - Examining Cloud Feedbacks in DOE's Global Storm Resolving Model, Li-Wei Chao
2:15-2:30 - Constraining model simulations of aerosol cloud interactions using activation rate from satellites observations, Chanyoung Park
2:30-2:45 - Improving aerosol indirect forcing from marine low clouds, Tianle Yuan

2:45-3:00 - A new method for diagnosing effective radiative forcing from aerosol-cloud interactions in climate models, Brandon Duran
3:00-3:15 - Constraining stratocumulus cloud-top entrainment feedback mechanisms in global models, Johannes Muelmenstaedt
3:15-3:30 - discussion

3:30-4:00 - Coffee/Tea Break

3:30-5:30 - Poster Session #2 (245 Beacon St, TBD)

7 pm Red Socks Baseball Game (OPT-IN)
Departing from 245 Beacon St at 5:30pm, or from Green Line B Boston College stop at 5:50pm, for Fenway Park

Wednesday June 5

8-9am – Breakfast (245 Beacon St, 1st floor atrium)

Session #5: Climate Dynamics (Clouds, Circulations, Pattern Effect) (245 Beacon St, Rm 107)
Chairs: Sarah Kang, Yue Dong
9:00-9:15 - Tropical Pacific SST Pattern Problem, Masahiro Watanabe
9:15-9:30 - Crucial Role of Sea Surface Temperature Warming Patterns in Near-Term High-Impact Weather and Climate Projection, Ming Zhao
9:30-9:45 - The role of the Bjerknes and low-cloud feedbacks in the formation of the eastern equatorial Pacific warming pattern, Minmin Fu*, Alexey Fedorov
9:45-10:00 - Tropical Pacific responses to idealized subtropical low cloud forcing through subsurface oceanic adjustment, Matt Luongo
10:00-10:15 - ENSO provides a strong observational constraint on the pattern effect, Tyler Hanke
10:15-10:30 - discussion

10:30-11:00 - Coffee/Tea Break

11:00-12:30 - Breakout discussion session #2 (245 Beacon St)

1) **Rm 107** What happened in 2023/2024? Implications for pattern effect, cloud-aerosol interactions, and climate sensitivity (led by Gavin Schmidt and Masahiro Watanabe)
2) **Rm 102** Informal MIPs including RCEMIP (led by Allison Wing)
3) **Rm 125** *TBD. Ideas? let Jen Kay know.*

12:30-2:00 – Lunch (Lyons Dining Hall)

Session #6: Climate Dynamics (Clouds, Circulations, Pattern Effect) (245 Beacon St, Rm 107)
Chairs: Masahiro Watanabe, Yen-Ting Hwang
2:00-2:15 - Examining the Relationship between Cloud Biases and Climate Modes in Large Ensembles, Brian Medeiros
2:15-2:30 - Unforced Earth's energy imbalance tied to subtropical low-cloud variations, Ayumu Miyamoto
2:30-2:45 - Distinct drivers of changes in Walker circulation and tropical convection, Sarah Kang
2:45-3:00 - discussion

3:00-3:30 - Coffee/Tea Break

Session #7: Convective Cloud Processes (245 Beacon St, Rm 107)
Chairs: Clare Singer, Allison Wing
3:30-3:45 - A robust constraint on the response of convective mass fluxes to warming, Andrew Williams
3:45-4:00 - The SST pattern effect on OLR: the role of convective aggregation, Heng Quan
4:00-4:15 - T Mock-Walker Simulations as the Second Phase of RCEMIP, Allison Wing
4:15-4:30 - discussion

4:30-6:30 pm - Poster Session #3 (245 Beacon St, TBD)

7 pm Conference Dinner (OPT-IN) (Lyons Dining Hall)

Thursday June 6

8-9am – Breakfast (245 Beacon St, 1st floor atrium)

Session #8: Extratropical Cloud Processes (245 Beacon St, Rm 107)
Chairs: Alejandro Bodas-Salcedo, Jen Kay
9:00-9:15 - A New Estimate of the Climate Sensitivity of CMIP Earth System Models, Ivy Tan
9:15-9:30 - Cloud albedo biases over high-latitude oceans from a cloud controlling factor perspective, Joaquin Blanco
9:30-9:45 - Clouds drive the wintertime surface energy budget response to temperature variations at a long-term Arctic observatory, Leah Bertrand
9:45-10:00 - Why Does Atmospheric Radiative Heating Weaken Midlatitude Cyclones?, Eric Mischell
10:00-10:15 - discussion

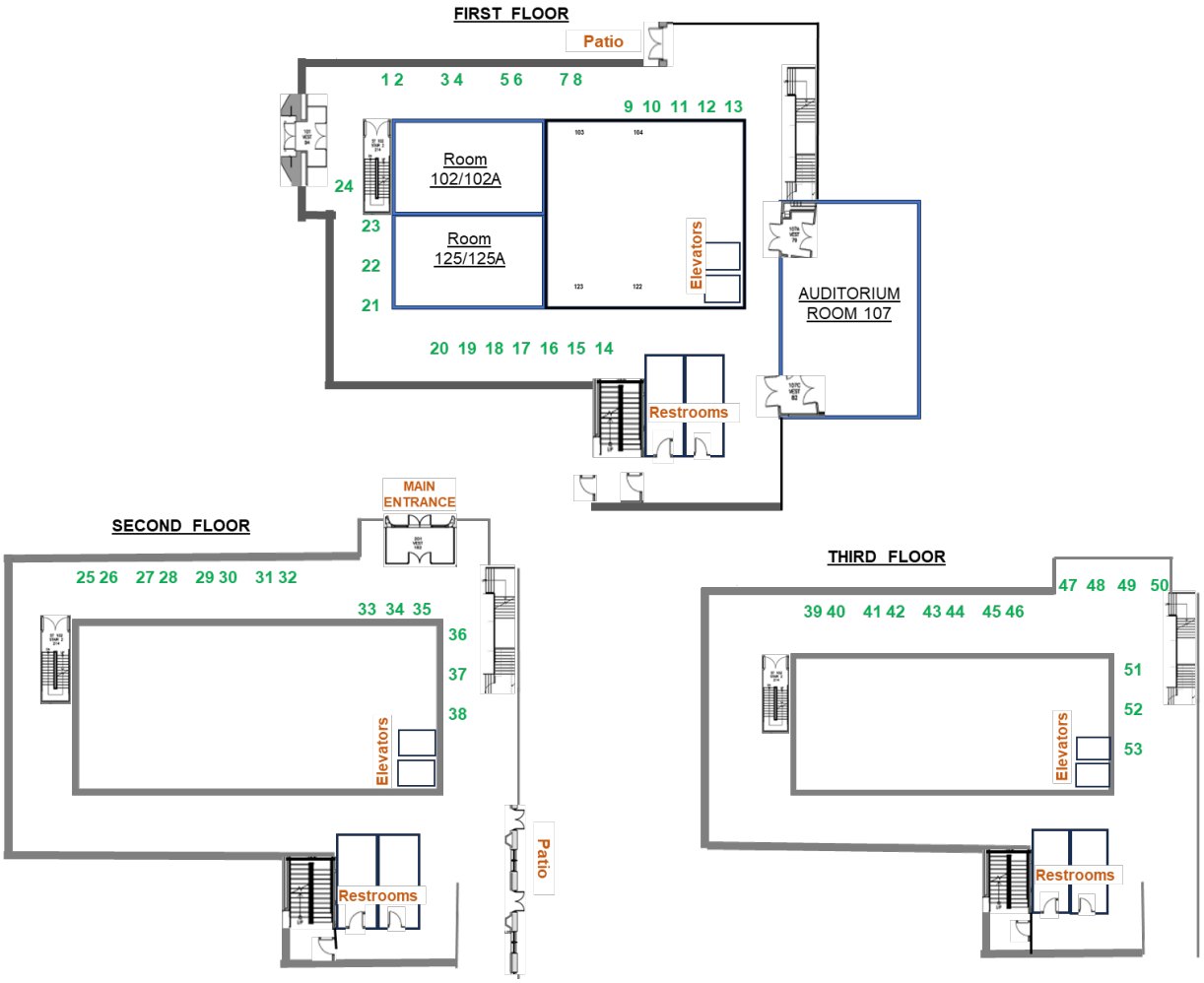
10:15-10:45 - Coffee/Tea Break

Session #9: Precipitation Processes (245 Beacon St, Rm 107)
Chairs: Arianna Varuolo-Clarke, Mark Webb
10:45-11:00 - Response of atmospheric circulation and precipitation to warming in a global storm resolving model, Ilai Guendelman
11:00-11:15 - Cloud radiative effects promote a large intermodel spread in hydrological sensitivity, Zachary McGraw
11:15-11:30 - Long-term changes in the shape of the precipitation distribution from station observations, Angeline Pendergrass
11:45-12:00 - Discussion

12:00-12:30 – Concluding discussions and Looking forward (245 Beacon St, Rm 107)
12:00-12:20 – CFMIP Experiments for CMIP7, Mark Zelinka, Paulo Ceppi, Alejandro Bodas-Salcedo
12:20-12:30 – Next plans for CFMIP with co-chairs Jen Kay, Sarah Kang, George Tselioudis

Adjourn at 12:30. Box Lunch (pick up at 245 Beacon St, 1st floor atrium)

Map of poster session locations (easel # in green)



Poster Session #1: Monday 4:30-6:30pm (easel # in green)

Poster	Poster Title and Authors	Easel #
1)	Climate and climate response to forcing for a wide range of ocean circulations - Kyle Armour, Zho Ragen, Robert Fajber, and Aaron Donohoe	16
2)	Constraining low-level cloud feedback and cloud dependency to environmental factors in CMIP models - Assia Arouf, Gregory V. Cesana, Andrew Ackerman, Robert Pincus, Ann Fridlind, Gregory Elsaesser and Maxwell Kelley	17
3)	Two Ubiquitous Radiative States Observed Across the High Latitudes - Tristan L'Ecuyer, Cameron Bertossa	18
4)	The relationship between condensate lifetime and precipitating efficiency and their response to sea surface warming - Hassan Beydoun, Nadir Jeevanjee, Aaron Donahue, and Peter Caldwell	19
5)	Assessment of the simulation the tropical SST pattern during the historical period in the CMIP6 ensemble - A. Bodas-Salcedo, J. M. Gregory, D. M. H. Sexton, and C. P. Morice	20
6)	Assessing the Thermodynamic Contribution to Trade Cumulus Feedback - Ruy Hernan Campos, Lukas Kluft, Ann Kristin Naumann, Bjorn Stevens	21
7)	An evaluation of Arctic supercooled clouds in GISS-ModelE3 and CMIP6 models - Greg Cesana, Israel Silber, McKenna Stanford, Yuan-Jen Lin, Ann Fridlind, Andrew Ackerman, Greg Elsaesser and Maxwell Kelley	22
8)	CloudBench: Benchmark Large-eddy Simulations for Parameterizations of Turbulence, Convection, and Clouds - Sheide Chammas, Tapio Schneider, Qing Wang, Yi-fan Chen, Cenk Gazen, John Anderson	23
9)	The fast responses of CO2 increase: insights from a general circulation model and a global storm-resolving model - Yan-Ting Chen, Timothy M. Merlis, Yi Huang	24
10)	Learning Entrainment Closures in a Hybrid Machine-learning Parameterization: A Case Study on Eastern Pacific cfSites - Costa Christopoulos, Zhaoyi Shen, Tom Beucler, Tapio Schneider	25
11)	The Transition to Double-Celled Circulations in Mock-Walker Simulations - Nicholas Lutsko, Timothy Cronin	26
12)	A simple model for instantaneous radiative forcing by optically-thin gases - Paulina Czarnecki, Lorenzo Polvani, Robert Pincus	27
13)	Tropical High Cloud Feedback Relationships to Climate Sensitivity - Emma Dawson, Kathleen Schiro	28
14)	Leveraging a radiatively-balanced climate model PPE to better understand how cloud and convective processes affect the southern hemisphere jet stream location - Bithi De, Gregory Elsaesser and Allegra N. LeGrande	29
15)	Understanding of mesoscale convective systems simulation in weather and climate models - Wenhao Dong; Ming Zhao; Lucas Harris; Kai-yuan Cheng; Linjiong Zhou; V. Ramaswamy	30
16)	Contribution of stratospheric ozone depletion to the recent tropical La Nina-like warming pattern - Yue Dong; Lorenzo Polvani; Yen-Ting Hwang; Mark England	31
17)	Mechanisms of the pattern effect in CESM - Margaret L. Duffy, Brian Medeiros, Andrew Gettelman	32
18)	Mid-Pliocene climate forcing, sea-surface temperature patterns, and implications for modern-day climate sensitivity - Dvorak, M., Armour, K., Feng, R., Cooper, V., Burls, N., Zhu, J., Proistesescu, C.	33
19)	An analytical model for convective system areal growth rates - Gregory Elsaesser, Remy Roca, Thomas Fiolleau, Jingbo Wu, Andreas Prein, Scott Giangrande, Steve Lang, Adrian Loftus, Qilong Min	34
20)	The Shortwave Cloud Feedback and its Impact on East Pacific Multi-Decadal Variability - Mark Zelinka and Zachary Espinosa	35
21)	The Seasonal Evolution of Low Clouds and the Southern ITCZ over the East Pacific Ocean - Fouzia Fahrin, Alex O. Gonzalez, Gregory V. Cesana, Charlotte A. DeMott, and Richard Neale	36
22)	Influence of turbulent mixing on clouds and cloud feedbacks in storm-resolving models -Romain Fievet, Cathy Hohenneger, Bjorn Stevens	37
23)	Constraining Model Representations of Shallow Convective Mixing and Shallow Cumulus Physics with Observations of Stable Water Isotopes - Michelle Frazer, Sylvia Dee, Adriana Bailey, Jesse Nusbaumer	38
24)	A Radiative Feedback Jacobian from Regularized Linear Regression - Leif Fredericks, Maria Rugenstein, Dave Thompson	39

25)	How to chase the signal of a model parameterization change in a global climate model -Ash Gilbert, Jen Kay, Penny Rowe	40
26)	The Importance of Relative Humidity Trends for Global Clear-Sky Longwave Feedback Estimates from Reanalysis Data – Helene Gloeckner, Lukas Kluft, Bjorn Stevens, Hauke Schmidt	41
27)	The dependence of the climate sensitivity on the Coriolis effect of rotating planets -Abisha Mary Gnanaraj, Jiawei Bao and Hauke Schmidt	42
28)	Dynamical Importance of the Trade Wind Inversion in Suppressing the Southeast Pacific ITCZ - Alex O. Gonzalez, Indrani Ganguly, Marissa Osterloh, Gregory V. Cesana, Charlotte A. DeMott	43
29)	Impact of atmospheric cloud radiative effects on the persistence of the Southern Hemisphere eddy-driven jet stream in observations and CMIP6 models - Xinhuiyu Liu, Kevin M. Grise	44
30)	Understanding the relationship between cloud controlling factors and the ISCCP weather states - Kevin M. Grise, George Tselioudis	45
31)	The influence of stratocumulus on climate sensitivity - Jian Guan, Nicole Neumann, Robert Pincus, Arlene Fiore, Brian Medeiros, Clare Singer	46
32)	The pattern effect induces spurious global cooling of the surface in historical climate model simulations, which is compensated for by an underestimation of the radiative response to global mean surface warming - Robin Guillaume-Castel, Benoit Meyssignac	47
33)	What Causes the Low-Level Cloud Increase from April to May Over the Arctic? - Ryan Haas	48
34)	Impacts of the Atlantic Meridional Overturning Circulation on Global and High-Latitude Warming Uncertainty - Hahn, L.C., Eisenman, I., and Lutsko, N. J.	49
35)	State dependence of radiative feedbacks and its implications for climate sensitivity -Haozhe He, Brian J. Soden, Bosong Zhang, Wenchang Yang, Gabriel A. Vecchi	50
36)	Consistent cloud tracer transport and aerosol activation by boundary layer updraft improve low clouds in the GFDL atmospheric models with two-moment cloud microphysics - Zhihong Tan, Ming Zhao, and Huan Guo	51
37)	Little Change in Apparent Hydrological Sensitivity at Large CO2 Forcing - Dana Raiter, Lorenzo M. Polvani, Ivan Mitevski, Angeline G. Pendergrass, Clara Orbe	52

Poster Session #2: Tuesday 3:30-5:30pm (easel # in green)

Poster	Poster Title and Authors	Easel #
38)	More extreme Indian monsoon daily rainfall in El Niño summers - Spencer A. Hill, Destiny Zamir Meyers, Michela Biasutti, Adam H. Sobel, Mark A. Cane, Fiaz Ahmed, Michael K. Tippett	1
39)	The Role of Clouds in Connecting Atmospheric Blocking and Surface Extremes - Ka Ying Ho, Lei Wang, Bryce E. Harrop, L. Ruby Leung	2
40)	Observed Relationships between Sea Surface Temperature, Vertical Wind Shear, Tropical Organized Deep Convection, and Radiative Effects - Wei-Ting Hsiao, Eric D. Maloney, Nicolas M. Leitmann-Niimi, and Christian D. Kummerow	3
41)	Robust Increase in South Asian Monsoon Rainfall Under Global Warming Driven by Southern Ocean Heat Uptake and Eurasia Cloud Changes - Yong-Jhih Chen, Yen-Ting Hwang*, and Jian Lu	4
42)	ClimKern: a new Python package and kernel repository for calculating radiative feedbacks - Tyler P. Janoski, Ivan Mitevski, Ryan J. Kramer, Michael Previdi, and Lorenzo Polvani	5
43)	Can global storm-resolving models simulate the land-ocean contrast in deep convection? - Tristan Abbott and Nadir Jeevanjee	6
44)	Potential applications of PATMOS-x cloud datasets in climate model research - Jongjin Seo, Michael Foster, and Coda Phillips	7
45)	Sea surface temperature trend discrepancies impact Southern Hemisphere extratropical circulation trends - Joonsuk M. Kang, Tiffany A. Shaw, Sarah M. Kang, Isla R. Simpson, Yue Yu	8
46)	Factors determining tropical upper-level cloud radiative effect in the radiative-convective equilibrium framework - Hyoji Kang, Yong-Sang Choi, and Jonathan H. Jiang	9
47)	Do Low-level Clouds Strengthen Summertime Subtropical Highs? - Hideaki Kawai and Tsuyoshi Koshiro	10

Poster Session #3: Wednesday 4:30-6:30pm (easel # in green)

Poster #	Poster Title and Authors	Easel #
72)	Enhancing Low Cloud Feedback Analysis through High-Resolution Multi-scale Modeling Frameworks - Liran Peng , Peter Blossey , Walter Hannah , Chris Bretherton, Chris Terai, Andrea Jenney, Michael Pritchard	35
73)	Putting an oscilloscope to the climate system: resonant response of the tropical Pacific to external forcing - Cristian Proistosescu, Malte F Stuecker	36
74)	Exploring the Interplay between Cloud Feedback and Aerosol-Cloud Interaction Using an E3SM Perturbed Parameter Ensemble - Yi Qin, Po-Lun Ma, Mark Zelinka, Stephen Klein	37
75)	Dependence of the precipitation intensity distribution on spatial resolution in GPM-IMERG - Akshay Rajeev, Angeline G. Pendergrass	38
76)	Assessing the Impact of Surface Energy Inputs on Radiative Feedbacks in Tropical and Extra-tropical Regions: Strength, Evolution, and Timescales - Pietro Salvi, Jonathan Gregory, Paulo Ceppi	39
77)	Natural surface temperature variations in regions of tropical deep convection are strongly damped by atmospheric heat transport - Maile Sasaki, Cristi Proistosescu, Chen Zhou	40
78)	Evaluation and Improvement of Numerical Models Constrained to Doppler Velocity Observations with the EarthCARE Satellite: Insights from Sub-Kilometer Mesh NICAM Simulations - Masaki Satoh, Woosub Roh, Shuhei Matsugishi	41
79)	Cloud radiative heating and its role in controlling oceanic tropical mesoscale convective lifecycles - Laura Paccini, Kathleen Schiro, James Ruppert	42
80)	Evaluating convective quasi-equilibrium in a global cloud-resolving model - Seth Seidel, Nathan Arnold	43
81)	New Spectral Radiation Diagnostics for Model Evaluation and Climate Change Detection - Jonah Shaw, Dustin Swales, Jennifer Kay	44
82)	Integrating an Eddy-Diffusivity Mass-Flux Scheme in the CliMA Atmosphere Mode -Zhaoyi Shen, Anna Jaruga, Dennis Yatunin, Charles Kawczynski, Costa Christopoulos, Nat Efrat-Henrici, Tapio Schneider	45
83)	Constraining turbulent mixing in oceanic shallow cumuli using in situ and simulation methods - Walter Shen, Fay√ßal Lamraoui, Zhiming Kuang	46
84)	Earth's hemispheric albedo asymmetry: an energy budget perspective - Clare E. Singer, Robert Pincus, Yi Ming	47
85)	Radiative Feedbacks from Dry Environmental Air Accelerate Tropical Cyclogenesis-Brian Soden, Shun-Nan Wu	48
86)	Diagnosing Surface Cloud Feedbacks in the Arctic: A Novel Method - Catherine L. Stauffer, Ivy Tan, and Quentin Coopman	49
87)	Beyond the mean: Drivers of the SST variance change pattern - Malte F. Stuecker, Jacob Gunnarson, Sen Zhao	50
88)	Response of Aerosol-Cloud Interactions to Global Warming in Large Eddy Simulations -Hongwei Sun, Peter Blossey, Robert Wood, Ehsan Erfani, Sarah Doherty	51
89)	Limited-Domain Radiative Convective Equilibrium with a Surface-Driven Diurnal Cycle for Understanding the Precipitation Diurnal Cycle Over Land - Zhihong Tan, Ming Zhao, and Baoqiang Xiang	52
90)	Elucidating boundary-layer aerosol-cloud interactions in the southeast Atlantic - Tyler Tatro and Paquita Zuidema	53
91)	Climate feedbacks and its resolution sensitivity in Cess-Potter simulations with the global kilometer-scale SCREAM - Christopher Terai, Noel Keen, Peter Caldwell, Hassan Beydoun, Benjamin Hillman, Li-Wei Chao, Mark Zelinka, and the SCREAM team	1
92)	Relationship between tropical cloud feedback and climatological biases in clouds and precipitation - Chad Thackeray, Mark Zelinka, Jesse Norris, Alex Hall, Stephen Po-Chedley	2
93)	Predicting the Frequency of Low Cloud Mesoscale Morphologies in Extratropical Cyclones Using Cloud Controlling Factors - Shuoyun Tong; Robert Wood; Tianle Yuan	3

94)	Systematic Errors in Regional Sensitivities to Cloud Controlling Factors and their Implications to Cloud Feedback in a Perturbed Parameter Ensemble - Yoko Tsushima, David Sexton, John Rostron, and Gill Martin	4
95)	Constraint on Net Long Term Climate Feedback to Emerge From Satellite Observed Internal Variability by Mid 2030s - Alejandro Uribe, Frida A.-M. Bender, and Thorsten Mauritsen	5
96)	Nonlinear Feedbacks Elucidated by Explainable Artificial Intelligence - Senne Van Loon, Maria Rugenstein, & Elizabeth A. Barnes	6
97)	Effect of Cloud Layer on Instantaneous Radiative Forcings of Greenhouse Gases - W. A. van Wijngaarden and W. Happer	7
98)	Exploring drivers of observed and modeled mid-latitude precipitation change - Arianna Varuolo-Clarke, Jennifer Kay, Brian Medeiros	8
99)	Effects of idealized thermal and mechanical forcings on tropical rainfall at scales of tens to hundreds of kilometers - Timothy W. Cronin and Martin Velez-Pardo	9
100)	Constraining model cloud feedback by cloud sources and sinks in extratropical cyclones.- Geethma Werapitiya, Daniel McCoy, Greg Elsaesser, Ci Song, Andrew Gettelman, Trude Eidhammer, Jingbo Wu, Emily Dellaripa	10
101)	The Response of Global Mean Precipitation to Surface Warming in AMIP and CMIP Experiments - Wenchang Yang, Chenggong Wang, Gabriel Vecchi	11
102)	A Predator-Prey Model for Nonlinear Precipitation Oscillations in Hothouse Climates -Da Yang	12
103)	Recommendations for Diagnosing Cloud Feedbacks Using Cloud Radiative Kernels-Mark D. Zelinka, Li-Wei Chao, Timothy A. Myers, Yi Qin, and Stephen A. Klein	13
104)	Climate feedback and sensitivity depend on the pattern of radiative forcing - Bosong Zhang , Ming Zhao , Haozhe He , Brian J. Soden , Zhihong Tan , Baoqiang Xiang , and Chenggong Wang	14
105)	PJ Tuckman, An Assessment of the Atmospheric Energy Transport in CMIP6 Models	15
106)	Yue Dong, Jen Kay, Antonietta Capotondi, Sara Sanchez, Clara Deser - Competing and synergistic climate effects of anthropogenic aerosols and greenhouse gases	16