



PDC22

4th Workshop on Physics-Dynamics
Coupling in Weather & Climate Models

A Workshop in Memory and Honor of Markus Sebastian Gross
Princeton University, 1–3 June 2022

Wednesday Morning 1 June Physics-Dynamics Interactions I

- 9:00 Introduction
- 9:15 S-J Lin: Design and Performance of a global prediction system based on the “Super Dynamics on the Cube” (Keynote)
- 10:15 Jane Baldwin: Alternative Assumptions about Topographic Height Improve Coupled Global Climate Model Simulation Fidelity
- 10:45 Break
- 11:15 Thomas Bendall: Physics-Dynamics-Chemistry Coupling with components of different resolutions in LFRic
- 11:45 Bryce Harrop: The role of subgrid winds on precipitation biases in E3SMv1 (Virtual presentation)
- 12:15 Discussion

12:30: Lunchtime

Wednesday Afternoon 1 June: Coupling Techniques I

- 1:30 Inna Polichtchouk: Resolved gravity waves in the stratosphere: Impact of horizontal resolution increase from O(10 km) to O(1 km) (Keynote)
- 2:30 Vijay Tallapragada: Advances in operational modeling at NCEP: The Unified Forecast System (Virtual presentation)
- 3:00 Break
- 3:30 Spencer Clark: Correcting a coarse-grid climate model in multiple climates by machine learning from global 25-km resolution simulations
- 4:00 Grant Firl: Common Community Physics Package: 2022 Update and Future Direction
- 4:15 Linjiong Zhou: Integrated Dynamics-Physics Coupling in GFDL-SHiELD
- 4:30 Vanesa Magar: An Extreme Variable Grid Model for Local High-Resolution Weather Forecasts from Global Initial Data
- 4:45 Discussion

5pm: Reception

6pm: Banquet

Thursday Morning 2 June: Coupling Techniques II

- 9:00 Hui Wan: Improving the numerical accuracy and physical realism of process coupling in an atmospheric general circulation model (Keynote)
- 10:00 Xi Chen: iDust - an inline dust prediction system powered by FV3-based SHIELD NWP system (Virtual presentation)
- 10:30 Break
- 11:00 Yi-Hsuan Chen: Exploring Two Coupling Strategies of the Boundary Layer and Convection Schemes in GFDL AM4
- 11:30 Panos Stinis: Improving solution accuracy and convergence for stochastic physics parameterizations with colored noise (Virtual presentation)
- 12:00 Adam Herrington: Climate and Computational Savings of the Lower Resolution Physics Grid in CESM (Virtual presentation)
- 12:15 Discussion

12:30: Lunchtime

Thursday Afternoon 2 June: Physics-Dynamics Interactions II

- 1:30 Ben Shipway: Physics, Dynamics and Coupling in the UK Met Office atmospheric models (Keynote)
- 2:30 Isaac Ginis: Impact of shoaling waves on wind stress and drag coefficient in coastal waters (Virtual presentation)
- 3:00 Break
- 3:30 Brandon Reichl: Energetically Consistent Boundary Layer Parameterization for Ocean Climate Models (Virtual presentation)
- 4:00 R. John Wilson: Modeling the Coupled Cycles of Dust and Water with the NASA Ames Mars Climate Model
- 4:30 Discussion

Friday Morning 3 June: Theory of Coupling

- 9:00 Christopher Eldred: Multiscale geometric mechanics formulations for GFD parameterization
- 9:30 Christopher Vogl: An Error Analysis Framework for Process Coupling in Atmospheric Models
- 10:00 Oksana Guba: Enthalpy fluxes in EAM
- 10:15 Break
- 10:45 Christiane Jablonowski: Assessing the interaction between dissipation and physical processes in FV3-based GCMs via idealized test cases
- 11:15 Peter Lauritzen: Reconciling and improving formulations for thermodynamics and conservation principles in Earth System Models (ESMs)
- 11:30 Discussion

End of Workshop