Experimentation and Development of Physical Parameterizations for Numerical Weather Prediction Using a Single-Column Model and the Common Community Physics Package (CCPP)

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Topics for this Course

Single-Column Model (SCM)

- A simplified, unidimensional model that can be used to test modeling concepts and software
- Driven by experimental case studies

Common Community Physics Package

- A library of physical parameterizations that can be used as suites
- A framework to connect the physics to the SCM and other models

Agenda

Time	Topic
8:00	Opening and introductions
8:15	The CCPP single-column model
8:45	The CCPP
9:15	Hands-on exercises
10:00	Break
10:30	Hands-on exercises
11:45	Wrap-up
12:00	Course ends

What you will learn in course

- General concepts about SCM and how it can be used as a tool in model development
- Which case studies are available with the SCM
- General concepts about the CCPP and its software architecture
- Which parameterizations/suites are available on CCPP
- How NOAA is using the CCPP as a tool to enable R2O
- How to run the SCM in an Amazon Web Image and generate plots
- How to make changes in the physics suite and namelist
- How to make code changes to modify a parameterization
- How to inspect the plots to analyze the results of code changes
- Where to find resources to use the SCM and CCPP after you leave this course

Topics not covered in this course

- How to create new SCM cases from other field experiments
- How to use CCPP with other models
- How to build all the libraries needed prior to installing the SCM
- Knitting, weaving, fishing, …

Resources continuing to use the SCM and CCPP

- CCPP website
- SCM v3 User's Guide
- CCPP v3+ Technical Documentation
- CCPP v3 Scientific Documentation
- Helpdesk: gmtb-help.ucar.edu

(Note that SCM and CCPP v4 will be released in February)

AMS Talks Related to CCPP and SCM

Tuesday 01/14, 03:15 PM - 03:30 PM. Room 257AB.

6A.2 Combining the Common Community Physics Package with a Single-Column Model to Drive NWP Physics Advancements. Grant J. Firl, NCAR and the Developmental Testbed Center, Boulder, CO; and D. Heinzeller, L. Xue, and L. Bernardet.

Tuesday 01/14, 04:00 PM - 06:00 PM. Hall B.

646 An Evaluation of Common Community Physics Package (CCPP) Physics Suites across Scales. Kathryn M. Newman, NCAR, Boulder, CO; and T. J. Hertneky, E. A. Kalina, M. Harrold, L. Pan, G. Firl, E. D. Grell, L. Carson, and M. Ek.

647 One-Stop Shopping for Physics across Scales: From a Single-Column Model to Three-Dimensional Configurations for Weather and S2S. Linlin Pan, NOAA/GSD, Univ. of Colorado/CIRES, and Developmental Testbed Center, Boulder, CO; NOAA, Boulder, CO; and L. Bernardet, D. Heinzeller, E. Kalina, G. Firl, E. Grell, K. Newman, L. Carson, and G. Grell

Wednesday 01/15, 03:15 PM - 03:30 PM. Room 251.

11B.2 The Common Community Physics Package (CCPP): Unifying Physics across NOAA and NCAR Models Using a Common Software Framework. Dom Heinzeller, NOAA/ESRL/GSD, and Univ. of Colorado/CIRES, and Developmental Testbed Center, Boulder, CO; and G. J. Firl, L. Bernardet, L. Carson, M. Zhang, S. Goldhaber, C. Craig, D. Gill, M. Duda, and F. M. Vitt.

Thursday 01/16 11:00 AM - 11:15 AM. Room 257AB.

12A.3 Physics Interoperability as a Strategy for Advancing NOAA's Unified Forecast System Physics Suites Ligia Bernardet NOAA/GSD, and Developmental Testbed Center, Boulder, CO; and G. J. Firl, D. Heinzeller, L. Carson, M. Zhang, J. Schramm, and L. Nance

About the practical exercises

- You will use an Amazon Machine Image (AMI) to run the practical exercises
- The SCM with CCPP is already installed and ready to use
- Exercises
  - Shallow convection case: run using 3 physics suites and compare results
  - Deep convection case: run using 3 physics suites and compare results
  - Compile modified source code to try to improve the deep convection results for a suite
    - The code has been modified for you, but we will show you what/how was done
  - Test the modifications in two deep convection cases

Sign up sheet and survey

- Please sign the sign-up sheet
- Please complete the survey. Your feedback is very important

Instructors

Grant Firl
NCAR

Dom Heinzeller
NOAA GSD & CU/CIRES

Laurie Carson
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Ligia Bernardet
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Participants

Please say your

- Name
- Institution or Company
- Occupation (student, teacher, researcher, forecaster, etc.)
- Area of interest (meteorology, NWP, etc.)
- Briefly, what brought you here and what you expect to get from this course