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Facilitating the development of complex models with the Common Community Physics Package and its Single-Column Model

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The Common Community Physics Package (CCPP) is a collection of atmospheric physical parameterizations and a framework that couples the physics for use in Earth system models. The CCPP Framework was developed by the U.S. Developmental Testbed Center (DTC) and is now an integral part of the Unified Forecast System (UFS), a community-based, coupled, comprehensive Earth modeling system designed to support research and be the source system for NOAA's multi-scale operational numerical weather prediction applications.

A primary goal for this effort is to facilitate research and development of physical parameterizations, while simultaneously offering capabilities for use in operational models. The CCPP Framework supports configurations ranging from process studies to operational numerical weather prediction as it enables host models to assemble the parameterizations in flexible suites. Framework capabilities include flexibility with respect to the order in which schemes are called, ability to group parameterizations for calls in different parts of the host model, and ability to call some parameterizations more often than others. Furthermore, the CCPP is distributed with a single-column model that can be used to test innovations and to conduct hierarchical studies in which physics and dynamics are decoupled.

There are today more than 30 primary parameterizations in the CCPP, representing a wide range of meteorological and land-surface processes. Experimental versions of the CCPP also contain chemical schemes, making it possible to create suites that tightly couple chemistry and meteorology.

The CCPP is developed as open-source code and has received contributions from the wide community in the form of new schemes and innovations within existing schemes. In this poster, we will provide an update on CCPP development and plans, as well as review existing resources for users and developers, such as the public releases, documentation, tutorial, and forum

