

Physics Interoperability: Connecting MMM Shared Physics to the CCPP Single-Column Model

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The NSF NCAR's System for Integrated Modeling of the Atmosphere (SIMA) is in the process of adopting the Common Community Physics Package (CCPP). The MMM Physics group has built a physics suite that is sharable and operable across the Model for Prediction Across Scales (MPAS), the Weather Research and Forecasting (WRF) model, and the Cloud Model 1 (CM1), and seamlessly updated in all three models. The NCAR side of the Developmental Testbed Center (DTC) is striving to connect the MMM physics operable across MPAS, WRF, and CM1 to the CCPP single-column model (SCM). We will present the progress of a pilot DTC project, in close collaboration with the MMM physics group, to make the MPAS *mesoscale_reference* physics suite technically and scientifically functional in the CCPP SCM that serves as a simplified host model. The work will demonstrate the interoperability of the MMM shared physics across multiple host models (such as the CCPP SCM, the Unified Forecast System, etc), which use the CCPP Framework. We will introduce how the implementation, feasibility, scientific testing, and evaluation have been conducted for three MMM physics schemes, namely the YSU PBL, MM5 revised surface layer, and WSM6 cloud microphysics schemes. We will highlight the capabilities and merits of the CCPP SCM.