

# **Radiative-convective-equilibrium as a “boutique” configuration of the Simple-Cloud-Resolving-E3SM-Atmosphere-Model (SCREAM)**

*Thursday 6 May 2021 16:00 (1h 45m)*

The Simple-Cloud-E3SM-Atmosphere-Model (SCREAM) is currently being developed as the high resolution (~3 km grid spacing) version of the US Department of Energy's new Energy Exascale Earth System Model (E3SM). A new suite of cloud physics parameterizations has been implemented to accommodate the partially cloud resolving resolution of SCREAM. In particular, turbulence, shallow convection, and macrophysics are handled by the Simple Higher Order Closure (SHOC) and microphysics is handled by the Predicted Particle Properties (P3) scheme.

In order to efficiently examine and scrutinize the new model's physical soundness - especially as it pertains to clouds - a Radiative-Convective-Equilibrium (RCE) configuration run on a reduced radius aquaplanet has been implemented. This presentation will highlight the utility of RCE as a testbed for new generation cloud resolving climate models and in the process of doing so will introduce a new cloud and precipitation diagnostic framework that could be used in any RCE model to quantify the sources and sinks of cloudiness.

This work was performed under the auspices of the US DOE by Lawrence Livermore National Laboratory under contract No. DE-AC52-07NA27344 IM release number LLNL-ABS-804065.

**Authors:** BEYDOUN, Hassan (Lawrence Livermore National Laboratory); CALDWELL, Peter (Lawrence Livermore National Laboratory ); HANNAH, Walter (Lawrence Livermore National Laboratory ); DONAHUE, Aaron (Lawrence Livermore National Laboratory ); BOGENSCHUTZ1, Peter

**Presenter:** BEYDOUN, Hassan (Lawrence Livermore National Laboratory)

**Session Classification:** RCE and Processes in Deep Convective Organization

**Track Classification:** RCE and Processes in Deep Convective Organization