

CGD Seminar Series

The challenge of energy budget closure in Earth system models

Peter Lauritzen

NCAR

Date: Tuesday 16 March 2021

Time: 11am – 12pm

For Zoom information, please contact Tracy Baker tbaker@ucar.edu

For live stream information, visit the [CGD Seminar Webpage](#)

ABSTRACT

A closed total energy (TE) budget is of utmost importance in coupled climate system modeling. In the case of the atmosphere it involves physical parameterizations, the dynamical core solver, the coupling between the two (referred to as physics-dynamics coupling) and fluxes from the surface components. The budget is rather complicated partly due to the fact that all parts of an Earth System Model are involved and, even on a continuous level, it is not straightforward how to formulate energetically and thermodynamically consistent equations for a moist atmosphere containing falling hydrometeors.

A detailed analysis of the spurious sources/sinks of TE in the National Center for Atmospheric Research's Community Atmosphere Model (CAM) is given. This includes spurious sources/sinks associated with the parameterization suite, the dynamical core, TE definition discrepancies, and physics-dynamics coupling. It will also be discussed how to move towards a more comprehensive and thermodynamically consistent formulation of TE in CAM.

For more information, contact Tracy Baker | tbaker@ucar.edu | x1366