

Towards community tools for LBL modeling and CKD generation

Robert Pincus, University of Colorado
robert.Pincus@colorado.edu

k-distributions for the people

A mostly US-based consortium was awarded funding to build “A flexible framework for radiation parameterizations traceable to benchmarks” in early 2020 based on a proposal written late 2018 (pre-CKDMIP)

The central idea is to provide user-friendly tools for doing line-by-line calculations and building *k*-distributions over as wide a range of conditions as possible.

Two main motivations:

Enable users to explore cost-accuracy trade-offs *where the user defines what accuracy means*

Enable application-specific *k*-distributions including paleo-climate (exoplanets?)

NWP

Limited area modeling

Radiative convective equilibrium...

Advert: we are seeking two postdocs for this project now (GFDL, Columbia University)

What we've learned

Earlier this year we hosted two meetings focused on the calculation of fluxes

Issues in establishing benchmarks: data, process representation, radiative transfer choices, ...

Survey of line-by-line tools

Informal meeting summaries are available

Opportunities

Our project is committed to delivering a tool (and/or data) chain in the next three years. This will include

- ways to generate absorption spectra under arbitrary conditions (or a data-based alternative)

- tools to compute one or more flavors of k -distributions

- ways to evaluate k -distributions against test conditions

with some emphasis on modern software/environments

We had planned to develop these tools “from scratch” but developments since we wrote the proposal may change our plans

We are quite open to collaborations - now would be a good time to set these up