Knowledge Transfer

Breakout Sessions 1 & 2

Book Update

The Development of Atmospheric General Circulation Models: Complexity, Synthesis, and Computation

Edited by Leo Donner, Wayne Schubert, Richard Somerville

JAMES Advisory Board Meeting

James Kinter (Chair), IGES

- Robert Dickinson, Georgia Tech
- Inez Fung, UCB
- ★ Kevin Hamilton, U. Hawaii
- ★ Arthur Hou, NASA Goddard
- ★ Dennis Lettenmaier, UW
- Steve Lord, NCEP
- Martin Miller, ECMWF
- ★ David Randall, CSU
- Masaki Satoh, FRCGC
- ★ Maria Silva Dias, CPTE

- Schedule biannual meetings via telecon

JAMES Editorial Board

- 9 Subject Editors are sufficient to handle current editorial work load/generally reflect scope of journal
- Add specialist in numerical methods, Sci. Ed. and/or policy

JAMES Editorial Policies

- Authors can opt out of JAMES-D and submit directly to JAMES
- JAMES-D discussion forum remains open for a submission until a final editorial decision is entered

  (Do we want to be a journal or an archive? - journal)
- JAMES-D manuscripts are removed when an article is either published to JAMES or rejected. (tech. docs, stand alone code, data sets must be accompanied by at least a short write up suitable for pub. in JAMES)
- If authors do not respond with revised manuscript within specified time period (as determined by the Editor) the article is effectively withdrawn and the submission manuscript is removed from JAMES-D

JAMES marketing, etc.

- Presence at EGU/other meetings: announcement by session chairs, presenters
- Expand listserve announcements
- Periodic email updates to registered users of the journal and members of JAMES listserve
- Further develop policy to waive page charges for authors who lack funding for publication expenses
- Add FAQ to answer questions about the journal
- Advisory Board will solicit review articles
- DOI 10.394/JAMES.2009.1.1 (prefix, abbr.year.vol#.art#)
- A&I service registrations (ISI, DOAJ...)

JAMES Current Status

- 13 submissions (at least one in each of the four journal sections)
- 2 accepted to date and in production
- Goal to have 5 final articles in production by mid-March (for ISI evaluation period)
- In last stage of finalizing PDF typesetting

J. Adv. Model. Earth Syst., **Vol. 001**, 1–9

Monte Carlo spectral integration: A consistent approximation for radiative transfer in large eddy simulations

Robert Pincus[1] *and Bjorn Stevens*[2]

[1] University of Colorado and NOAA Earth System Research Laboratory, Boulder, CO, USA
[2] Department of Atmospheric and Oceanic Sciences, University of California Los Angeles, CA, US and Max Planck Institute for Meteorology, Hamburg, Germany

Manuscript submitted 28 June 2008; revised 3 November 2008

Large-eddy simulation (LES) refers to a class of calculations in which the large energy-rich eddies are simulated directly and are insensitive to errors in the modeling of sub-grid scale processes. Flows represented by LES are often driven by radiative heating and therefore require the calculation of radiative transfer along with the fluid-dynamical simulation. Current methods for detailed radiation calculations, even those using simple one-dimensional radiative transfer, are far too expensive for routine use, while popular shortcuts are either of limited applicability or run the risk of introducing errors on time and space scales that might affect the overall simulation.
A new approximate method is described that relies on Monte Carlo sampling of the spectral integration in the heating rate calculation and is applicable to any problem. The error introduced when using this method is substantial for individual samples (single columns at single times) but is uncorrelated in time and space and so does not bias the statistics of scales that are well resolved by the LES. The method is evaluated through simulation of two test problems; these behave as expected. A scaling analysis shows that the errors introduced by the method diminish as flow features become well resolved. Errors introduced by the approximation increase with decreasing spatial scale but the spurious energy introduced by the approximation is less than the energy expected in the unperturbed flow, i.e. the energy associated with the spectral cascade from the large scale, even on the grid scale.

DOI:10.8394/JAMES.2009.1.4

1. How much approximation is acceptable in radiative transfer treatments for large eddy simulation?

The term "large-eddy simulation'' (LES) is sometimes used to describe a class of numerical models with high spatial resolution, but it more properly refers to a class of calculations: those in which the large energy-rich eddies are directly simulated, as opposed to being modeled (meaning represented in the abstract), and which are not well-characterized medium and unbounded computational resources. Radiative transfer can be quite important; many flows of interest (*e.g.*, stratocumulus) are driven directly by local heating resulting from the divergence of radiative fluxes. The computational costs of the most detailed calculations are far too high for use in LES, however. Given the computational burden of exact treatments of radiative transfer, and the interest in how such fluxes couple and co-evolve with the flow, there is a long tradition