Geoscientific

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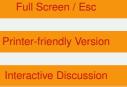
Interactive
Comment

Interactive comment on "The Met Office Unified Model Global Atmosphere 4.0 and JULES Global Land 4.0 configurations" *by* D. N. Walters et al.

Anonymous Referee #1

Received and published: 5 July 2013

The paper documents the GA4.0/GL4.0 Met Office configurations as an overview to the public. It has to be estimated that this configuration is intended to be used seamlessly across all scales and prediction systems. It is a great achievement to attack different prediction goals with one model system, even though this might enforce compromises for the different prediction modes (see water loading example towards the end of the paper).

One cannot expect detailed scientific discussions of the configuration in this manuscript. This has been reported elsewhere - and is heavily cited throughout the paper. Nevertheless, this compilation reports an overview about an agreed-on version in a certain development state. Therefore it is valuable for people who want to experiment further with this system.

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Because of the tremendous diversity of the different model components, none of them can be described in detail. This makes it sometimes hard to read. Therefore I wish that some minor changes that improve the readability should be considered from the authors.

Structure of the paper:

The sequence of the description and the physical interrelations of the processes that involve moist physics should be reconsidered. For instance, it would be better to pass the wave drag parameterization (2.5,2.6) to another place in the manuscript in order to put the moist processes closer together. For me, it is not very clear what distinguishes large scale precip and large scale clouds (even though I have some idea). Section 2.8 could follow 2.4 and 2.7 could then be the next.

Question about some details:

Section 2.1) There can't be 3 prognostic thermodynamic variables. One of potential temperature, Exner pressure, or density must be a diagnostic variable. There is nothing said about typical time-steps for the different resolutions. This is important to know because of the sub-timesteps mentioned in Section 2.3.

Section 2.2) Are some of the absorbing gases prognostic? Which? Are the calls to the radiation schemes always only once in 3h? Does this depend on the timestep or spatial resolution?

Section 2.7) Which thermodynamic variable is in fact mixed in the boundary layer scheme?

Section 3.3) The authors mention an iteration scheme inside the microphysics and a change from doing the iterations over columns or surfaces. To me it is not clear what the physical meaning of this iteration should be and why it should give different results when doing the mentioned alteration.

Interactive comment on Geosci. Model Dev. Discuss., 6, 2813, 2013.

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