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Geoscientific Model Development Discussions

Interactive comment on "Overview of the Meso-NH model version 5.4 and its applications" *by* Christine Lac et al.

Christine Lac et al.

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We thank Referee 2 for his/her comments. We answered below to all the points. Changes made to the original version of the paper appear in track-change mode on the enclosed pdf.

Ref2: 1) section 2.1: with the two-way interactive nesting, what frequency of updating do you typically use both to provide the boundary forcing for the "son" and also the upscale relaxation for the "father"? These details should be given in the examples cited later in the paper.

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Ref 2: 2) section 3.6: are there any issues when nesting this anelastic model inside an NWP model (such as ARPEGE) than uses a different equation set? For example, is it even possible to match completely the temperature, pressure, height and density profiles? Also, how do you choose the reference profile that is needed under the anelastic approximation in these cases?

Authors: There is probably a confusion in the sense that there is no nesting between Meso-NH and the NWP model. This probably comes from the sentence: initial and coupling fields can be provided by analyses or forecasts from the following NWP suites. The term coupling is replaced by forcing as there is no feedback from Meso-NH to the NWP model. There is no issue to initialize and force Meso-NH with a coarse model presenting different governed equations. At the initialization, thermodynamical fields are first adapted to the Meso-NH variables (absolute temperature to virtual potential temperature, specific humidity to vapor mixing ratio). Then pressure, potential temperature and mixing ratio are interpolated to the new grid. The reference state is computed from the virtual potential temperature, the mixing ratio and the reference state Exner function at model top, using the hydrostatic equation. Wind fields are then interpolated, and the anelastic balance corrects them to get a final non-divergent wind field.

Ref 2: 3) section 4.3: this section is slightly confusing in that it opens with "The convection scheme available in Meso-NH is KFB..." but then goes on to say there is in fact another, preferred scheme, PMMC09. It would be much clearer to say at the outset how many schemes are available and then to be clear too about which scheme is preferred in what configuration (be it resolution or application).

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Please also note the supplement to this comment:
https://www.geosci-model-dev-discuss.net/gmd-2017-297/gmd-2017-297-AC2-supplement.pdf

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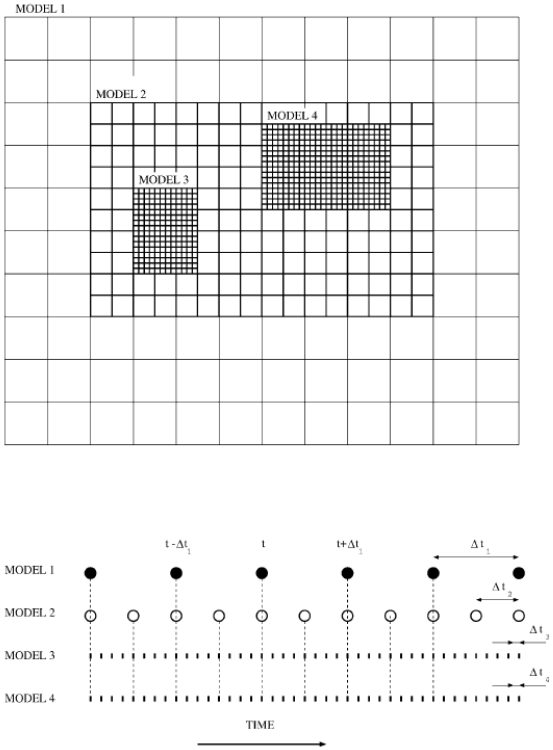

Fig. 1. Schematic diagram for the nesting configuration. The upper panel gives an example of the spatial distribution for the 4 models and the lower panel shows the nesting of the time-steps

Fig. 1.

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