Interactive comment on "Using a Virtual Machine environment for developing, testing, and training for the UM-UKCA Composition-Climate Model, using Unified Model version 10.9 and above" *by* Nathan Luke Abraham et al.

Anonymous Referee #2

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Abraham et al. (2018) describe how a global atmospheric chemistry-climate model (UM-UKCA) was modified for use in a virtual machine with a low memory footprint, making it easily portable to most modern desktop or laptop computers with the appropriate host software installed. The resolution of the model was significantly reduced, and a number of other features were disabled, rendering the model configuration unsuitable for production use. The point of the exercise however was to provide an environment suitable for certain kinds of model development and testing, and for training new users of the system.

The modifications to the base model are described, and the different use cases for this system are discussed. This paper should be interesting and useful for users of the virtual machine environment, and other workers who are also considering packaging such a model in a virtual environment. I recommend publication in GMD after a few minor revisions.

In your "Code Availability" section, you describe the restrictions and availability of the UM, but you do not mention anything about obtaining a VM image, except for a cryptic reference to "UMDP X10", which is not described any further. It might seem a bit pedantic, but since the whole paper is about this virtual machine, it would be nice to see some more text about its availability.

Page 4, line 2: Which diagnostics were turned off, and why are these "unnecessary"?

Page 4, line 9: A short discussion of the differences in the ozone simulated by the two configurations would be appropriate here. To put the changes into context, perhaps these differences could be compared with the multi-model spread in any of the recent model intercomparison exercises.

Table 1: I found the "Configuration details" of the black and purple curves slightly confusing. Instead of giving the number of timesteps in one model hour, it seems more natural to give the length of the timestep (eg. 20 minutes and 30 minutes).

Figure 2: By plotting the results of the full and reduced configurations next to each other, the reader is required to eyeball the two figures to get a sense of the differences between the simulations. For panels (b) and (d), I would prefer to see the plot of the full configuration as-is, and then a plot of the difference between the reduced and full versions. Also, what does "3-hour mean" mean in this context? Is this a single 3-hour period from one particular day? More information is needed here.

Page 6, line 10: The first "to" should be "do".

Page 11, line 22: What is "mule-cumf"?

Page 11, line 24: "of is desirable". I think you left out some words here.

Page 13, line 1: Can you provide some kind of link to the online tutorials? Ideally in a permanently-available archive? Or could you zip them and add them as a supplement to the paper?