

Review of Technical Note: ‘Harmonization of the multi-scale multi-model activities of HTAP, AQMEII and MICS-Asia: simulations, emission inventories, boundary conditions and output formats’, by Galmarini et al.

General Comments

This overview of the HTAP2, AQMEII and MICS-Asia modelling is a very useful and necessary technical description to accompany/precede the Special Issue papers. My specific comments below are mainly minor suggestions to clarify the text, with a few requests for additional material. The slightly more substantive comments concern the definition of the RERER metric and some of the descriptions of how global model output is used as boundary conditions in regional modelling. I have foregone anonymity as there is little to be critical of here, and I am perfectly happy for the authors to contact me informally if I can be of further assistance in making this overview as clear as possible. I fully support publication in ACP once the authors have considered these comments.

Specific Comments

P1 l2 Suggestion: in the title replace ‘Harmonization’ with ‘Coordination’ or ‘Coordination and harmonization’.

P2 l38 ...rectangular (in latitude-longitude coordinates)...

P3 l19-20 Suggest change text to: ‘...thus providing the opportunity of assessing the **application of these models** outside of **their** conventional modelling context.’

P3 l31 Should ‘in’ be ‘to and from’ (or ‘both within and to/from’)?

P3 l34 The framework **used**...

P3 l40 Capitalise Section (and subsequently p4 l38, p10 l28)

P3 l43 Insert the: ‘...**the** HTAP2/...’

P3 l44 Delete comma.

P4 l6-7 ‘were expected’ -> were output

P4 l11-13 Suggest change text to: ‘It **provides** specific details of the organization of the global HTAP2 and regional AQMEII3 activities, **but** only general information on the MICS3 experiments.’

P4 l16-17 Suggest change text to: ‘This note **provides** coherent... characteristics to **support** the analysis...’

P4 l20 ‘have to be’ -> were; ‘a’ -> this

P4 l26 Delete ‘Harmonization and’. I find ‘interoperability’ a rather obscure word. Perhaps it is better to say (if this is what it means): ‘Exchange of output data between global and regional models’?

P4 l28 ‘model’ -> model’s

P5 l8 Research

P5 l9-10 Insert bracket

P5 l15 ‘The so-called HTAP_v2.2 database’ -> The HTAP_v2.2 emissions database

P5 l17 Clarify what emissions are used for 2009 (interpolation of 2008 and 2010?)

P5 I21 Delete 'geo-' and comma after longitude.

P6 I7 '...not necessarily consistent **with each other**,...' (as opposed to not internally consistent?)

P7 I23 deposition **fluxes**

P8 I2 ...dark green colour (and with "1")...

P8 I3 delete 'colors'

P8 I13-14 ppb or ppbv (not ppbv)

P9 I4 The definition of RERER (specifically the different Rs) should be clarified. My suggestion: 'where R_{global} is the regional response of a quantity (e.g., surface O_3 concentration) in the global 20% perturbation simulation (GLO) minus the value in the unperturbed simulation (BASE); and R_{region} is the regional response of that quantity in the regional 20% emission perturbation simulation minus its value in BASE.'

It may be worth giving a specific example, e.g., the RERER metric for surface O_3 over Europe with respect to reducing NO_x emissions is derived from the EURNOX, GLONOX and BASE simulations:

R_{global} = surface O_3 over Europe (GLONOX) minus surface O_3 over Europe (BASE)

R_{region} = surface O_3 over Europe (EURNOX) minus surface O_3 over Europe (BASE)

P9 I15 become -> be

P10 I4-5 Delete three 'the's: 'the examination', 'the finer', and 'the different'

P10 I10 Should 'in' be 'at the boundaries of'? Or maybe sometimes values throughout the box are used, rather than just values at the boundaries?

P10 I22 base -> BASE

P10 I27 GLOBALL -> GLOALL (as in Table 3?)

P10 I27-28 The inclusion of...(GLOALL) allows consistent evaluation of the RERER metric for 20% reductions of all emissions in both global and regional models.

If I am correctly understanding the RERER metric, this actually requires the NAMALL, EURALL (etc.) simulations too, so the above sentence is a bit of an oversimplification.

P11 I8 where -> were

P11 I15 Where the appropriate global model simulation boundary conditions were not available, presumably regional models just used BASE? (or GLOALL?) Or something else? This should be clarified.

P12 I5 Don't highlight '2.5'

P13 I5 Norwegian Meteorological Institute?

P15 I13-14 No italics?

P16 I15 model -> models

P16 I19 delete 'dataset of'

P16 l25 add commas after collected and geo-referenced.

P16 l36-37 Also Asian domains? (and change both -> all?)

P16 l38 Capitalise Special Issue (also p1 l40)