

***Interactive comment on “Technical note:  
Harmonization of the multi-scale multi-model  
activities HTAP, AQMEII and MICS-Asia:  
simulations, emission inventories, boundary  
conditions and output formats” by Stefano  
Galmarini et al.***

**Anonymous Referee #2**

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Review of "Harmonization of the multi-scale multi-model activities HTAP, AQMEII and MICS-Asia: simulations, emission inventories, boundary conditions and output formats" submitted in 2016 to ACP by Galmarini et al. as a Technical Note.

**General Comment**

The submitted Technical Note presents the experimental scope and design of three important modelling exercises. It reviews the science and policy questions addressed

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by the experiments and the key features of the technical setup. As such it will provide a very useful reference for the forthcoming studies expected to be submitted to the ACP special issue. The paper is also of good scientific quality and therefore I fully support its publication, given that the only major comment mentioned below is addressed.

Although it exceeds the mandate of the reviewer, I have an editorial question on the relevance of publishing that note in ACP whereas, for instance, all the CMIP6 model experiment description papers are published in GMD that offers to share special issues across Copernicus Journals.

**Major Comment**

A list of participating models for each experiment (HTAP/AQMEII/MICS-ASIA) needs to be added in order to support the level of ambition of the exercise which is stated repeatedly in the paper (ex: p3L43: “probably making HTAP2/AQMEII3/MICS3 exercise the largest, multi-scale/multi-model activity ever performed in atmospheric chemical modelling”). Given the timeline of the analysis process (with a closure of the special issue in a few months from now) all the model production is probably achieved to date. Therefore, consolidated tables of the models participating to each exercise (including the sensitivity experiments within each exercise) should be proposed, possibly adding a category as “planned contribution” if still relevant at this stage.

**Minor Comments**

Add version numbers in the title: HTAP2, AQMEII3, MICS-ASIA3

P2L2: Add EMEP: “The Task Force on Hemispheric Transport of Air Pollution (TF HTAP) was organized in 2005 under the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) of the UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP) (see <http://www.unece.org/env/lrtap/welcome.html>)” (also in the conclusion P15L13)

P2L27: isn't the development of Integrated Assessment Tools such as HTAP-FASST

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Screening Tool part of HTAP2 objectives?

P2L46: beyond the improvement in the experiment setup between HTAP 1 and 2, the concomitant ongoing improvement in model development during the past decade should also contribute to the expected advances. A paragraph on the most important development in hemispheric chemistry-transport modelling would be appreciated: e.g. what is the order of magnitude of horizontal and vertical resolution increase? How many models now include secondary inorganic and organic aerosol? Is CH<sub>4</sub> lifetime now better constrained? (also relevant in the conclusion P16L12)

P3L3: In the CLRTAP/EMEP organisation, the regional counterpart of TF-HTAP for the European region would rather be the Task Force on Measurement and Modelling, formally speaking, it would be more appropriate to refer to AQMEII and MICS as partners of TF-HTAP.

P4L3: VOC stand for Volatile Organic Compounds

The output data formats are presented as interoperable between the global and regional portals in Section 1 (P4L8), Section 2 (P4L26), and even in the conclusion (P16L32), whereas in Section 2.5 it seems largely under development as a “pioneer” version (P13L15). Please provide more information on the design and status of this tool including the following items: Can HTAP model results be now visible in the ENSEMBLE portal, and can AQMEII data be presented in HTAP/AEROCOM tools? Does it work for all species and all models? Including grids, vertical profile, station extractions? What about interoperability with MICS outputs?

Figure 2: with emission of fire and dust left open to the modelling groups, it is unclear how the corresponding sensitivity experiment is designed.

P14L9: how are stored MICS output data: as grid or receptor based?

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