

Responses to the Editor :

Dear Editor,

Please find below the answers to your remarks. Note that new changes are in red colour in the last version of the manuscript.

- **As stated in the revised manuscript (last lines of p12), the present contribution can only be regarded as a first step in the development of a SIA module in MOCAGE given that nucleation and condensation are not included. These are important limitations which should be brought forward more explicitly in the abstract and in the title, that would for instance become “implementation of the ISORROPIA thermodynamic equilibrium model in the chemistry transport MOCAGE version R2.15.0” (other suggestions welcome).**

The work presented here is a first step, but it is a complete and validated module simulating secondary inorganic aerosols working at different scales. The future developments are meant to improve it. This is why we propose to change the title to “First implementation of Secondary Inorganic Aerosols into the chemistry transport model MOCAGE version R2.15.0”.

- **As pointed out in your answer to reviewer 2, the finest bin will only become relevant in the model when additional processes are implemented, please explain this rationale when introducing the bins p10.**

It has been done.

- **The representativeness of biogenic emission was questioned by two reviewers, while the answer provided in the response to reviewer 2 is satisfactory, it would have deserved a specific discussion in the revised paper.**

We agree that it is important to inform the reader that this point has been looked into. Nevertheless we think that the full argumentation given to the referees is too long to be included in the paper. This is why we only added a sentence explaining the impact on the model performances of using more recent biogenic emissions.

- **What is referred to as “HTAP observations” would merit clarification. The distinction between HTAP and EMEP observations is awkward as HTAP is actually part of EMEP. A number of observation networks are listed p17, and they should be acknowledged more explicitly. Last, a more direct link to the observation database should be given than www.htap.org.**

We do not understand this remark since the HTAP observation database gathers several databases including EMEP as mentioned in the text: “[...] the HTAP observation database. It includes data from several measurement networks: EMEP, IMPROVE, NAtChem, EANET, CREATE, EUSAAR, NILU and the WMO-PCSAG [...]”. The link to the EBAS database has been added to the text.

- **Section 5.3.1 should be renamed as there is no forecast mentioned here.**

The section has been renamed, the word forecast has been replaced by the word simulation.