

Interactive comment on “Impact of halogen chemistry on air quality in coastal and continental Europe: application of CMAQ model and implication for regulation” by Qinyi Li et al.

Anonymous Referee #3

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This paper presents a model study of the effects of halogen chemistry on the air quality of Europe. This study provides an interesting overview of the impact of halogens on ozone and other pollutants, a research question that is still open. The paper is well written and presented and I have only some minor comments (see below). Overall I think it is suitable for publication in ACP.

In Section 3.2 the CMAQ results are compared to the observations and to the GEOS-Chem results from Sherwen et al. (2017). First of all, there are other observations of CINO₂ in Europe besides those in Table 3. In fact some of these are mentioned in the Sherwen paper itself (as well as in Sommariva et al., 2018) and in Bannan et al.

C1

(2017). These measurements should be included in the discussion. Second, using the maximum observed concentration is not a good metric to assess the agreement with the model. For example, the observations in Phillips et al. (2012) show quite a range of peak nocturnal concentrations of CINO₂. I would also argue that GEOS-Chem shows better agreement with the measurements than CMAQ, especially wrt CINO₂ (lines 231-233). The discussion of the model-measurements comparison is better when dealing with iodine and bromine species, but please revise Section 3.2 to be more accurate.

Figure 2 is interesting in the sense that it shows some different results from the corresponding figure 5 in the Sherwen paper especially when it comes to BrO. It looks like CMAQ is calculating lower concentrations than GEOS-Chem both for Cl and for HCl, which deserves some comment. It would also be good to include some of the European observations of HCl in this discussion. I realize that a comparison between CMAQ and GEOS-Chem is beyond the scope of this paper, but the differences in the geographical distributions of some species (and related impacts on O₃ and other species) are sometimes striking and require at least a brief comment.

line 688: correct typo in name.

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C2