

Interactive comment on “Impacts of bromine and iodine chemistry on tropospheric OH and HO₂: Comparing observations with box and global model perspectives” by Daniel Stone et al.

Anonymous Referee #2

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The paper presents an interesting comparison between observations of OH and HO₂ at the Cape Verde Observatory and two modelling approaches to evaluate how bromine and iodine chemistry impacts HO_x. The results obtained by the two different model setups are discussed and evaluated in the context of the different chemical schemes and timescales considered in the two models. I found the paper interesting and well structured, presenting results in a clear and complete format and hence I recommend the paper for publication in ACP. Please find below two questions and minor comments for consideration by the authors: - In page 9, line 244, it is written that the box model is constrained by the mean observed mixing ratio of BrO and IO, 2.5 and 1.4 pptv, respectively. What was the peak value of BrO and IO in the model runs?, if the peak

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value used was 2.5 and 1.4, did you run a sensitivity with the XO peak values measured by Read et al., 2008 and Mahajan et al., 2010 ? - One thing that I miss in this paper is the how halogen-driven changes in NO_x affect HO_x?. There is not mention to this aspect and from previous modelling studies it is expected to have a bearing on HO_x. I would suggest the authors to mention whether they have explored this coupling and perhaps add some additional results to the revised manuscript.

Minor Comments: P2,L54: “ in in HO_x.”, please remove one “in”. P3,L81: please replace “troposphere” by tropospheric ? P31, Fig.1: For clarity, please improve quality in the box model results, e.g. what represents the yellow color?

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