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Interactive comment on “Reactive Halogens in the Marine Boundary Layer (RHaMBLe): the tropical North Atlantic experiments” by J. D. Lee et al.

Anonymous Referee #2

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This overview paper “Reactive Halogens in the Marine Boundary Layer (RHaMBLe) Programme” by Lee et al. describes the objectives and scientific context of the recent study of reactive halogens in the north-east tropical Atlantic atmosphere and makes a general introduction to the details of measurements on land (at Cape Verde), sea and air. It also summarizes in detail the scientific conclusions made in papers, in parallel, for this specific Journal. The details of meteorological conditions in spatial and temporal scale supplied in this paper give very useful information for future investigation of the data made in “RHaMBLe” campaign. This paper is well written and organized. I strongly recommend it to be published in this journal after minor corrections.

Major comments:

The only weakness I spot is in the discussion of halogen recycling and its impact. This

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is mainly reflected in section 3.5, in which I can not see the discussion of the difference in the bromine-induced ozone losses for Cape Verde calculated between the box model (Read et al., 2008) and a 3D model (O'Brien et al., 2009). A much larger ozone loss (~ 2 ppbv vs 0.5 ppbv in Read et al. 2008) is calculated in the 3D model under BrO levels of 2-3 pptv (without iodine chemistry). In the same paper, it also calculated that the oxidation of bromocarbons can not support a mean BrO level of 3 pptv in the marine boundary layer, which strongly suggests a sea salt bromine source. This significant difference in bromine-related ozone loss reflects the different treatments of the inorganic bromine budget from source to sink between the two kinds of models for MBL condition. This means our understanding of halogen recycling and its impacts on atmospheric oxidation is still poor.

Minor comments:

1. Change all ppt and ppb to pptv and ppbv respectively. For example: at P21744: line 26, and p21747 line 7.
2. P21745 line 5: there are two O₃, remove one
3. P21747 line 7: change diel to durnal
4. P21750 line 15: change figure 15 to 15a.
5. P21751 line 7: change figure 15 to 15b.
6. P21779: I can not find panel marks i, ii iii, and iv in figure 13

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 9, 21717, 2009.

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