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Interactive comment on "Reactive and organic halogen species in three different European coastal environments" *by* C. Peters et al.

Anonymous Referee #1

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This paper reports DOAS observations of halogen species (IO, OIO, I2 and BrO) at three rather different coastal sites. It makes an important contribution to understanding marine boundary layer chemistry, where there is currently a rather sparse data-set of measurements. There are some surprising and interesting differences between the sites - one can only agree with the authors that more measurements of this kind are required in order to understand the role of halogens on a regional, let alone global, scale.

The paper is very clearly written and appropriately illustrated, and should be published in ACP. There are, however, a few matters which the authors should address in a revised version of the paper:

1. OIO seems to be above the detection limit (3 ppt) on a number of occasions, as shown on close inspection of Fig.10. In addition, Table 3 indicates that the maximum mixing ratio during the campaign at Brittany was 13 ppt. However, in the text it is stated that OIO was never observed above the detection limit of the instrument. Some consistency is required.

2. Likewise, the paper states that BrO was never observed above its detection limit (2 ppt). However, in Table 3 a maximum concentration of 4 ppt is reported.

3. I2 was not detected in Brittany above the detection limit (20 ppt) because, according to the authors, the laminaria species were too far away from the light path of the DOAS instrument. However, there is another explanation worth considering. The campaign took place in April, when the sea and air would have been comparatively cold. Warmer temperatures probably increase plant stress and the corresponding emission of iodine species. Thus, elevated I2 mixing ratios could occur later in the summer, which was when I2 was observed in two different campaigns at Mace Head.

4. In the modelling of BrO, is heterogeneous processing taken into account? If so, what is the role of BrONO2 in the bromine chemistry? The authors report BrO values never exceeding 1 ppt because of high NOx. However, Sander et al. 1999 (GRL) studied the role of BrONO2 in the recycling of bromine through aerosols and found that for a polluted scenario (NO2 ~ 1 ppb) the formation of BrO following recycle and photolysis of Br precursors would be enhanced when including the uptake and subsequent conversion of BrONO2 into Br2 and BrCl.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 6077, 2005.