

## ***Interactive comment on “Iodine chemistry after dark” by Alfonso Saiz-Lopez et al.***

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This paper makes an important point about atmospheric chemistry. It is scientifically sound and rigorous except for the few items in Minor Comments, and except perhaps for the theoretical calculations in Section 3 on which I am not competent to express an opinion. It is also well written, except for the trivia listed under Editorial Comments below.

Provided it receives a satisfactory review from experts in calculation of reaction rates, I have no hesitation in recommending it for publication in ACP after minor revision.

Minor comments:

1. p14 line22 - according to the caption of Figure 11 (p39) it applies to the region 110 to 106degE and 16 to 23degN. This region just touches the southern tip of Baja California but is centred a long way to its south. It just touches a coastal region of mainland

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Mexico, but is never at the “coastal region” even of Mexico let alone the stated Baja California - much of the region is in what might be called the open ocean. Presumably this region is chosen because of the large pollution amounts there that we infer from Figures 7, 8 and 9; but there is no discussion of why they should be so large - is it a concentration of shipping using the Panama Canal that spreads out further north?

2. p6 line21 - given the argument of p6 lines17-18, why does a transition state 110 kN/mole above the reactants allow the reaction to proceed?

3. Why do Figures 4 and 5 have time co-ordinates starting at 48 hours? Is this to allow a steady state to build up? - if so it should be discussed. And what version of time is it - time since midnight or time since noon? - a careful reading of text and figures tells us which, but it should be spelled out in the caption. And why do Figures 10 and 11 have time co-ordinates that start at 0 hours rather than 48? And although we can guess that time in Figures 10 and 11 is since midnight, is it mean solar midnight over the region, or solar midnight at the geographic centre of the region, or midnight in the local time zone at 108degE?

4. We are told in the text (p14 line2) that Figure 8 has “as in the previous figure”.. “nighttime averaged differences”, yet p13 line17 tells us that the previous figure, Figure 7, uses “midnight averages”. Which are used in which figures, and why do the captions not spell out the averaging hours as opposed to having them buried in the text?

Editorial comments:

p3 line3 introduces and defines MBL but it was already used without definition on p2 line15.

p3 line10 - surely, hyphens after “iodine” and “bromine” ?

p4 line2 - delete “and”

p6 line12 - insert “of” after “energies”.

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p7 line13 - insert "the" after "of".

Fig4 lowest panel - the meanings of the four lines are not in the caption and their panel legends are obscure.

Figs 7, 8 and 9 - the captions do not say the altitude or the vertical extent of the averaging.

Fig10 - the right hand axis legend says "mixing ration".

Fig10 caption - insert "the" after "at".

Fig11 caption - say the altitude.

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