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Interactive comment on “Ratios among atmospheric trace gases together with winds imply exploitable information for bird navigation: a model elucidating experimental results” by H. G. Wallraff

Anonymous Referee #1

Received and published: 8 August 2013

General comments: I was asked to review this paper due to my experience as a biologist working on animal navigation, I have no experience of atmospheric chemistry, nor am I an expert in modelling techniques. On this basis my comments will be restricted to the biological aspects of the paper. In general the paper has a very sound theoretical background. The author is a well-known proponent of olfactory navigation in homing pigeons, and has written one of the most detailed and accurate books on the subject. As such, their citation of the literature is comprehensive. They should be commended for nevertheless acknowledging the main difficulty that remains in demonstrating olfac-

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tory navigation-what are the atmospheric signals? The paper appears to address this with a very compelling model that is a valuable addition to the field. Ultimately however, any model needs to provide predictions that are testable, but I did not see any testable predictions for navigation experiments come out of this model. I acknowledge that the author is perhaps trying to stimulate atmospheric physicists to do this however. Overall, this is an interesting paper with a sound basis in previous data and should be published.

Specific comments: I have comments which are perhaps more suggestions for future work than necessary additions to this paper, but I am interested in the author's thoughts

- 1) Pigeon homing has moved on from vanishing bearings now that we have gps tracking. Can the author think of a way to incorporate full tracks into the model?
- 2) Recent evidence hints at olfaction playing a role in migratory navigation, over much longer distances. Could the author incorporate this into the model to see whether the current model could work or whether an entirely different theoretical construct would be necessary to explain olfactory navigation over those longer distances?

Technical corrections: Line 21 "may also help to approach this problem" Page 12469 line 11 "Less certain. . ."

Interactive comment on Biogeosciences Discuss., 10, 12451, 2013.

BGD

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