Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2017-572-RC1, 2017

Atmospheric Chemistry and Physics Discussions

Interactive comment on "BrO and Br_y profiles over the Western Pacific: Relevance of Inorganic Bromine Sources and a Br_y Minimum in the Aged Tropical Tropopause Layer" *by* Theodore K. Koenig et al.

Anonymous Referee #1

Received and published: 4 August 2017

This paper describes airborne observations of bromine species (principally BrO) between the boundary layer and the lower stratosphere, over the tropical western Pacific. This is a region where there are very few observations, and so adds significantly to the global picture of bromine. The observations - mostly from airborne DOAS measurements - are compared with output from two global chemistry-climate models, and a chemical box model. There is thus a huge amount of data and careful analysis that has gone into the paper, making it quite a difficult paper to digest! In some respects it reads like several chapters of a PhD thesis, rather than a paper. Nevertheless, be-

cause the BrO levels are close to the instrument detection level, error analysis is very important and is discussed in detail, along with the actual location of the BrO retrieved from this remote sensing technique. The paper is extremely well written (with almost no typographical errors), and the diagrams are all appropriate and very clear, so the authors are to be congratulated on pulling together such a major undertaking.

I have two substantive comments. First, section 3 is labelled "Results", but actually contains a lot of discussion of the observational and modelling results which should really be in section 4 - "Discussion". Second, there is a very nice summary in Section 1 about the possible ways in which bromine could impact on tropospheric chemistry. I was therefore hoping to see a bit more discussion in the Conclusions about how the understanding gained from this study affects the assessment of these impacts. The authors conclude that the sea-salt source of bromine is not well described by the two global models, and these models also do not capture well the minimum in Bry in aged upper tropospheric air - so, is this an important result in terms of impacts on the troposphere?

Minor points:

page 2, line 2: are found

page 5, line 21: add a clause or reference to explain what the Kurucz spectrum is

page 21, line 11: CONTRAST

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2017-572, 2017.