

Interactive comment on “New Aura Microwave Limb Sounder observations of BrO and implications for Br_y” by L. Millán et al.

Anonymous Referee #2

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This paper describes an improved MLS algorithm for the retrieval of BrO. It briefly describes the algorithm, some error analyses, comparisons with models, comparisons with other BrO datasets, and an estimate of total Br_y and the portion from very short lived bromine-bearing species. A key aspect of this new algorithm is that profiles now extend into the mid-lower stratosphere. It is a solid enough paper and easy to follow, but perhaps a little light. There is one major point that needs to be addressed, and a few minor ones.

The major point relates to the comparisons with other datasets. The two datasets used for comparison (SCIAMACHY & OSIRIS) are made at different local times. The authors acknowledge that such "comparisons ... must be made with caution" (p. 334, line 10-11). So does this invalidate the comparisons, and if not, what does it mean?

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Generally for these types of comparisons one profile is scaled to the local time of the other instrument using output from a chemical model. Since this is effectively done in section 6 (to estimate Br_y), it is curious that it was not done here. This should be added in order to make the comparisons meaningful.

Other points:

page 326, line 4: "presented" should be "present"

page 326, line 21: Mention that inorganic bromine is much less abundant than chlorine. Otherwise one might get the impression chlorine is not nearly as important.

page 327, line 19: change "on" to "in", or give the day in July

page 329, line 14: Given the large random errors associated with a retrieval (based on one day of coadding spectra), why not average over a longer period, say 10 days? It seems like one could not use a single profile (with a random error of 25 ppt, from section 3.2) anyways. A statement clarifying this choice would be helpful.

section 3.1: What is the vertical resolution? State here.

page 330, section 3.2: Were forward model input parameter errors considered?

page 331, lines 17-18: "typicall small error sources" - what are these?

page 331, line 23: "retrieval numerics"? This seems vague; what are these?

page 332, line 16: These simulations are based on older JPL rate constants. How would more recent ones impact results, and are any relecant reactions missing?

section 6: The dervied value of 5+/-4.5 from VSLS is important. More discussion on this is warrented. For example, more deatil on how this compares with the other estimates from WMO (2010) would be very useful.