

Review from Ellis Remsberg of AMTD manuscript 2016-207 by Ronsmans et al.:

General comments:

The present manuscript extends a similar, earlier analysis of column measurements of HNO₃ from IASI as reported by Wespes et al. (ACP, 2009). It differs from that earlier work by showing quantitative comparisons with data from six representative NDACC stations that span the latitude range of the IASI measurements. Those comparisons with IASI and the seasonal HNO₃ distributions are also for a different year-2011. I find that the analysis approach, figures, and discussion of findings to be of very good quality, and I recommend publication after some very minor revisions.

Specific comments:

Introduction, p. 3, line 68—I would argue that it is difficult to use such column data for quantitative studies of the HNO₃-ozone cycles.

Section 5, p.10, line 303—The overestimation by IASI of 47% is rather large in the lower stratosphere for Lauder. I note that the *a priori* profile for HNO₃ comes from your chemistry transport model at up to 15.6 km altitude. Might this be a cause of the rather large bias?

Section 5, p. 11, line 308—Please add a few sentences about the hypotheses of Dufour et al. (2012). For example, I note that they discuss a likely interdependence for the retrieved partial ozone columns between the stratosphere and the UTLS regions.

Section 6, p. 13, lines 385-387—Day/night differences in HNO₃, due to photochemistry, ought to be small in the tropics below about 25 km. Is this the issue that you are referring to?

Section 7, p. 14, lines 433-435—This finding is important and may be one cause of the positive bias of 47% that you found at Lauder (see Section 5 comment above).

Technical comments:

Abstract, p. 1, line 2—I recommend “comprehend” instead of apprehend.

Introduction, p. 2, line 52—AURA operations began in 2004.

Section 3, p. 6, line 180—Say instead “This plot shows...”