

## ***Interactive comment on “Drift-corrected trends and periodic variations in MIPAS IMK/IAA ozone measurements” by E. Eckert et al.***

**Anonymous Referee #1**

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This study is focused on obtaining accurate ozone trends from MIPAS measurements obtained from 2002 to 2012. The methods used and the findings of the study are described by the authors. Estimates of a possible drift in the MIPAS measurements were obtained via comparisons with several coincident ozone datasets, including from ACE-FTS, Aura MLS, Odin OSIRIS, and ground-based lidar. The authors then go on to correct for that analyzed drift, prior to obtaining their final ozone trends. However, I am unconvinced from the analyses herein that there really is any significant drift in the measurements of MIPAS ozone.

My skepticism is as follows. In Section 2 the authors need to say right away what ozone quantities are being compared to obtain the MIPAS drift and are then analyzed for the ozone trends. For example, the AURA MLS data and the lidar data were con-  
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verted to ozone mixing ratio (MR) versus altitude. Is that the primary ozone quantity from MIPAS? Were the ACE and OSIRIS ozone profiles also converted to MR versus altitude before comparison with MIPAS? Specifically, the authors say that they used temperature profile data from ECMWF for their conversions. Yet, those operational temperature profiles are derived from nadir radiances that have a much lower vertical resolution than the retrieved ozone of the middle and upper stratosphere. As a result, periodic variations in ECMWF temperatures are damped, most likely, compared with the corresponding atmospheric oscillations that are affecting the observed ozone from the several satellite instruments (p. 17860, line 23). Trends in the ECMWF temperatures are likely incorrect, as well, or they carry their own uncertainties. One clue that temperature may be a problem is the finding that the analyzed drift increases with altitude (p. 17865, lines 12-15). Thus, temperature trend errors may be significant and ought to be mentioned. At the very least, they represent a separate source of uncertainty that ought to be addressed and explained to the reader before I can recommend publication of your manuscript.

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