Review of manuscript acp-2016-66 of Moreira et al.

General comments:

The authors analyze time series of ground-based, millimeter-wave ozone spectrometer profiles from 50 to 0.5 hPa at Bern, Switzerland, and relate the components of their variability to known atmospheric forcing mechanisms. Their analyzed semi-annual, annual, and QBO-like variations are in good agreement with those in the literature, as obtained from other data sets and with models. While those findings are not new, I suggest keeping them in the manuscript for completeness. The observed ozone responses to ENSO and solar cycle forcings ought to be of more interest to readers. The authors offer reasonable explanations for those longer-term responses. Overall, the manuscript is organized and written well. Figures are appropriate and illustrate the results clearly. The present manuscript is complementary to analyses of ozone trends by Moreira et al. (2015), who made use of the same data time series.

Specific comments:

p. 2, line 12—It would be helpful for the authors to mention one or more of the "open questions" (or give a reference to them) that they hope to address with their study.

p. 2, line 23—Mitchell et al. is concerned mainly with re-analyses of temperature, not ozone.

p. 2, line 26—As I am sure that the authors are aware, it is easier to be certain about a specific forcing mechanism from analyses of ozone data across multiple latitudes/longitudes, e.g., as from the analyses of satellite data by Nair et al. and Yang et al.

p. 3, line 13—The rather low vertical resolution of the profile data makes it difficult to sort out the effects of transport from meridional mixing versus that due to the Brewer-Dobson circulation or to resolve properly the ozone response to a solar cycle forcing in the upper stratosphere.

p. 8, line 24—"A possible role…" is not a complete sentence.

p. 10, lines 1 to 7—There is not a 1-year lag in the response of upper stratospheric ozone to the solar uv-flux forcing (Cunnold et al., 2004). Analyses for a solar cycle response in ozone are best done using the observed solar flux as a proxy, and Steinbrecht et al. seem to agree in their Reply (JGR, 2004, D14036, although not cited here). The analyses in the present manuscript are appropriate because they make use of time series of the F10.7 flux.

p. 10, lines 18ff—With this paragraph it should become clear to the reader that it is next to impossible to know about the cause(s) of decadal-scale forcings in time series of middle to lower stratospheric ozone from a single middle latitude station. To their credit, the authors seem to be acknowledging that difficulty in their discussion.

p. 10, line 33—"surprisingly strong ozone amplitude"…Are the authors referring to the 5% amplitude of lower stratospheric ozone in Figure 1?