

Interactive comment on “Spring and summer time ozone and solar ultraviolet radiation variations over Cape Point, South Africa” by D. Jean du Preez et al.

D. Jean du Preez et al.

dupreez.jd@gmail.com

Received and published: 17 September 2018

We would like to thank the Reviewer for taking their time to review the manuscript and for providing constructive comments. In the final revised manuscript we have addressed all of the reviewers' comments. Below we provide a point-by-point response to each of their comments and explain how we revised the manuscript accordingly.

We believe that we were sufficiently cautious about our definition of the clear-sky days, and in the revised version of the manuscript we made an effort to state that this is one of the critical points in the analysis. For that reason, we rephrased parts of Section 2.4.2 on page 6, to draw attention of the reader that: 1) there were no clear-sky observations

[Printer-friendly version](#)

[Discussion paper](#)



available for our study site, and 2) hence the need to numerically determine clear-sky days. Our methodology includes three different tests, and we also validated it against measurements for Cape Town, where cloud-cover observations are available.

The full discussion of the phenomena responsible for these results is planned to be presented in a future publication after further research has been carried out. However, in response to the reviewer's comment, the following has been added on page:15, line:14 "In fact, it is well known that Rossby planetary waves are generated due to the development of synoptic disturbances in the troposphere during winter and spring seasons. They propagate vertically through to the stratospheric layers when the zonal winds are westerly (Charney & Drazin, 1961; Leovy, et al., 1985). Moreover, as reported by many authors, gravity and Rossby planetary waves are involved in isentropic transport across the subtropical barrier. Portafaix, et al., 2003 studied the southern subtropical barrier by using MIMOSA model advected PV maps, together with a numerical tool developed by LACy (Reunion University) named DyBaL (Dynamical Barrier Localisation) based on Nakamura formalism (Nakamura, 1996). They showed that the southern subtropical barrier is usually located around 25-30°S, but has an increasing variability during winter and spring. Moreover, using MIMOSA advected PV fields (Bencherif, et al., 2007; Bencherif, et al., 2003) showed that exchange processes between the stratospheric tropical reservoir and mid-latitudes are episodic and take place through the subtropical barrier due to planetary wave breaking inducing increase or decrease of ozone at tropical and subtropical locations depending on the isentropic levels."

Interactive comment on Ann. Geophys. Discuss., <https://doi.org/10.5194/angeo-2018-56>, 2018.

Printer-friendly version

Discussion paper

