QOS2016-161, 2016
Quadrennial Ozone Symposium of the International Ozone Commission

Influence of the dynamical activity on the inter-annual variability of ozone in the tropics

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Reunion Island (21 ° S - 55 ° E) is one of few tropical station of the Network for Detection of Atmospheric Composition Change (NDAAC). The first measurements were carried out in 1992 and since 2012 a new observatory dedicated to atmospheric study have been commissioned (Maido Observatory 2200 m asl). The historical instruments are a UV-Vis spectrometer SAOZ that measures Total Column Ozone (TCO) continuously since 1993, and the balloon-borne ECC soundings, which are operational in the framework of the SHADOZ (Southern Hemisphere ADditional OZonesondes) network since 1998. More recently, a stratospheric ozone DIAL was installed early 2013 at the Maido observatory. This instrument has already performed more than 160 profiles over three years.
Interannual variability and trend of ozone above this tropical site was investigated using a multi-linear regression analysis (Trend-run) on the de-seasonalised monthly mean SAOZ TCO and ECC profiles. Duration of measurements for the DIAL is currently too short to investigated inter-annual variability.
Forcings representing the 11 years solar cycle, the El Nino Southern Oscillation, the Quasi- Biennial Oscillation have been used to perform reference analysis. The dynamical influence was studied by introducing of new proxies characteristics of wave activity (Eliassen-Palm flux), or the subtropical barrier location in regard to Reunion Island. The aim of this study is to estimate how the addition of new dynamical can improve the quality of the regression model and quantify the dynamic impact on this variability. The trend analysis has been estimated before and after 2000.