

Evolution of Ozone above Togo during the 1979–2020 Period

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Abstract

The objective of this paper is to estimate the trend of the Total Ozone Column (TOC) over Togo. A MultiSensor Reanalysis-2 (MSR-2) of the TOC over the entire territory of Togo was used. A Multiple Linear Regression (MLR) method has been applied to retrieve the interannual contributions of different forcings and the long-term variability. It was found that the Annual Oscillation (AnO), the Quasi Biennial Oscillation at 30 mb (QBO30), the Solar Flux (SF), and the El Niño–Southern Oscillation (ENSO) has a statistically significant influence on the interannual variability of the TOC. The strongest contribution (22 ± 1.4 DU) is allocated to the AnO while the weakest (<1 DU) is attributed to the Semi-Annual Oscillations (SAO). Before the peak year of the Equivalent Effective Stratospheric Chlorine (EESC) in the tropics in 1997, the trend is negative ($-0.3\% \pm 0.9\%$ per decade) and is not statistically significant. After the peak year, a statistically significant positive trend is observed. The trend of the TOC is $0.6\% \pm 0.2\%$ per decade. The monthly TOC trend over Togo is positive and statistically significant during the rainy season (particularly during the monsoon period) except in April, unlike during the harmattan period (DJF), where the trend is not significant.

Early Career Scientist

YES, I am an early career scientist.

IGAC Activities

TOAR: Tropospheric Ozone Assessment Report, CCMi: Chemistry Climate Model Initiative

IGAC Regional Working Groups

ANGA: African Group on Atmospheric Sciences