Ozone Observations Over Mt. Kenya and Nairobi GAW (Global Atmosphere Watch) Stations

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The World Meteorological Organization (WMO)/GAW stations Mt. Kenya and Nairobi are located close to the equator on the western end of the Indian Ocean. The Mt. Kenya station is a high-mountain site at 3678 m a.s.l., Nairobi is a NASA-SHADOZ ozone-sounding site at (1˚ 18S, 36˚ 45´E, 1795 m a.s.l.. All sites are influenced seasonally by air masses from the W. Indian Ocean, biomass burning from southern Africa, and the Saharan/Arabian region, respectively. Measurements of the vertical profile of ozone concentration using balloon-borne ECC ozonesondes have been made weekly since 1996 at Nairobi weather observatory. There are 469 valid data among 509 samples. Carbon Monoxide observations and other trace gases are ongoing at Mt. Kenya GAW station since 2000. We present an analysis of trends and changes of the vertical distribution of ozone over Kenya. A statistical analysis of ozone profiles split into 3 layers reveals strong yearly variation in the free troposphere and the tropopause region, while ozone in the stratosphere appears to be relatively constant throughout the year. Total ozone measured by Dobson Spectrophotometer indicates lower values in OND [October, November, and December-*Rainy season*] and high values in JJA [June, July, August-*Cold dry season*]. The high altitude Mt. Kenya station Ozone is influenced by long range transport of air mass burning products from Southern Africa, Saharan and Arabian region. Diurnal cycles are consistent with up-slope winds and rising PBL during the day; and down-slope winds and inflow of free tropospheric air during the night. Ozone levels have shown to be higher on high altitude (Mt. Kenya) than Nairobi GAW observatory.

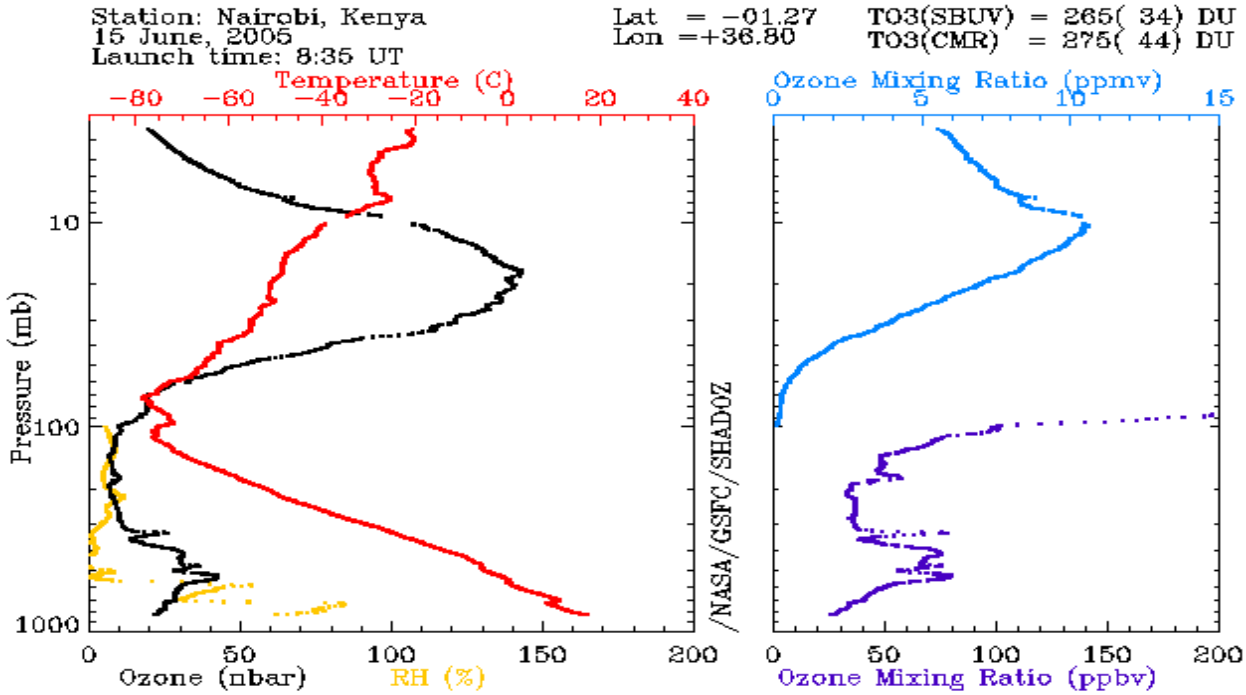

Figure 1. Ozone observations over Mt. Kenya and Nairobi GAW stations.