

The First Reprocessing of SHADOZ (Southern Hemisphere Additional OZonesondes) Data Records

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Long-term ozonesonde data records support satellite validation, model evaluation and studies of atmospheric pollution and dynamics. The SHADOZ (Southern Hemisphere Additional OZonesondes) network is a NASA Goddard Space Flight Center project in collaboration with the ESRL/GMD, and international partners from Asia, Africa and Europe to archive long-term ozonesonde records from tropical stations. Started in 1998, SHADOZ has archived over 6000 ozone and P-T-U (pressure-temperature-humidity) profiles from over a dozen tropical and subtropical stations with a launch frequency of 2-4 soundings per month. Like many long-term sounding stations, SHADOZ has been characterized by variations in operating procedures, instrumentation, sensing solution, and data processing. Thus, there are variations in agreement with satellite ozone and biases among stations and within the data record of an individual station. These contribute to measurement uncertainty and may limit the reliability of ozone profile trends. A major milestone for 2016 is the first major SHADOZ re-processing that accounts for these changing techniques in ozonesondes. The extent of re-processing varies from station to station. Complete re-processing can be restricted due to unavailable or incorrect metadata, instrument version, and limited software capabilities in the historic record. These factors explain most changes observed in each stations' re-processed ozone time series when compared to its original time series. Such differences can be as high as ± 4 DU and are most evident in the stratospheric portion of the profile. We use ozone products from Aura's OMI (Ozone Monitoring Instrument) and MLS (Microwave Limb Sounder) to quantify the impacts of re-processing on the agreement with the satellite data. The overall agreement between ground-based column ozone from Dobsons, OMI, and sondes is improved significantly in several stations largely due to corrections in the background current of the ozonesonde and pump efficiency correction factors (PCF) in the stratosphere. All stations show better agreement with MLS in the midstratosphere due to corrections in the PCF.

SHADOZ Sites, URL=<http://croc.gsfc.nasa.gov/shadoz>



Figure 1. Map of SHADOZ ozonesonde stations.