

QOS2016-213, 2016

Quadrennial Ozone Symposium of the International Ozone Commission

© Author(s) 2016. CC Attribution 3.0 License.

Archival of Early Rocket Ozone Data in the WOUDC

D. P. Haffner (1,4), A. J. Krueger (2,4), E. Hilsenrath (2,4), and S. H. Hwang (3)

(1) Science Systems and Applications, Inc., Lanham, MD, United States (david.haffner@ssaihq.com), (2) University of Maryland Baltimore County, Baltimore, MD, United States, (3) Korea Aerospace Research Institute, Daejeon, South Korea, (4) NASA Goddard Space Flight Center, Greenbelt, MD, United States

Ozone distributions in the photochemically-controlled upper stratosphere and mesosphere were first measured using spectrometers on V-2 rockets after WWII. The IGY (1957-1958) spurred development of new optical and chemical instruments for flight on meteorological and sounding rockets. In the early 1960's, the US Navy developed an Arcas rocket-borne optical ozonesonde (ROCOZ) and NASA GSFC developed Nike Cajun and Arcas rocket chemiluminescent ozonesondes. In 1969, the Navy program was moved to GSFC for expanded geophysical research including satellite technique development. After the Arcas ROCOZ instrument was modified to fly on Super Loki-Dart rockets in 1975, the rocketsonde ozone flights continued until 1994 at 11 sites from the equator to 65 N and 35 W to 160 W. Over 300 optical soundings and 40 chemiluminescent soundings were made. The data were used to produce the 1976 US Standard Atmosphere ozone distribution, determine latitudinal, seasonal, and diurnal variations, and validate early models. The current data recovery effort also includes soundings conducted by Australia, Japan, and Korea using optical techniques.

New satellite ozone sounding techniques established in the 1970's were initially calibrated and later validated using the rocket ozone data. As satellite techniques superseded the rocket methods, the sponsoring agencies lost interest in the data and many of those records have been discarded. In the current task much of the data from the private records of the experimenters and their publications have been digitized and archived in the WOUDC (World Ozone and Ultraviolet Data Centre). Most of the original data records are handwritten tabulations and computer printouts that were scanned for the archive, while other data are digitized from published figures. All of the data are converted to a standard digital format. The newly recovered data records, which date back to 1965, will make pre-satellite upper-atmosphere ozone data available to the Earth science community for atmospheric research.