

File Revision Date:

March 20, 2023

Data Set Description:

PI(s): Katrin Mueller, Markus Rex
Instrument: ECC Ozonesondes
Site: Palau
Atmospheric Measurement Quantities: Ozone partial pressure (PO3) (undefined value code: **99.99**)
Pressure (Press)
Temperature (Temp)
Relative humidity (RH)
Geopotential height (GeopHgt)
GPS Altitude (GPSHgt)
Longitude (Lon)
Latitude (Lat)
Wind direction (DD) (undefined value code: **999**)
Wind speed (FF)
Internal Instrument Quantities: Pump Temperature (PmpT)
Pump Voltage (Vpmp)
Pump Current (Ipmp)
Ozone Current (Ozi)

Contact Information:

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Data format:

ASCII Format

1. line: Launch Time (Format: YYYY-MM-DD hh:mm:ss)
2. line: Quantities (first quantity is elapsed time after launch in seconds, others see description above)
3. line: Units
4. and following lines are data

Instrument Description:

The ECC Ozonesonde (Electrochemical Concentration Cell Ozonesonde) is a lightweight, balloon-borne instrument mated to a meteorological radiosonde and flown to 30+ km while transmitting data back to a ground station. The heart of the ozonesonde is an electrochemical concentration cell (ECC) that senses

ozone as it reacts with a dilute solution of potassium iodide to produce an electrical current proportional to the ozone concentration of the air.

Ozone sensor:

Science Pump Corporation (SPC) ECC-6A

Radiosonde:

VAISALA RS41

Sensing Solution Type (SST):

1% KI, 1.0x (full) buffer

Partial Pressure Ozone(nb) = $0.004307 * i * \text{Temperature} * t * \text{pcf}$

where:

the constant is half the ratio of ideal gas constant to Faraday's constant.

i is the current from the sensor - background in μA .

t is the time in seconds to pump 100 CCs of air through the pump.

Temperature is the pump temperature (K).

Pcf is the pump correction factor to account for loss in pump efficiency at lower pressures.

Overall performance of Ozonesondes:

[Ozonesonde Measurement Principles and Best Operational Practices: ASOPOS 2.0 \(Assessment of Standard Operating Procedures for Ozonesondes\) August 2021](#)