

File Revision Date:

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Data Set Description:

PI: Margarita Yela Gonzalez

Instrument: ECC ozonesonde

Site(s): Belgrano II, Antarctica (77.86 S, 34.61 W)

Measurement Quantities: Pressure, Temperature, RH, Wind speed and direction, Geopotential height, Ozone partial pressure, Box temperature,

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Instrument Description:

The ozonesonde equipment at Belgrano is based on a receiver Marwin II DIGICORA 15. Two types of Electrochemical Concentration Cells have been used in Belgrano II along the years: Science Pump Corporation (SPC) and ENSCI Corporation.

The sonde was interfaced to a meteorological radiosonde from Vaisala for pressure, temperature and humidity data. TOTEX balloon (TX-1200) filled with helium have been used. A dip-oil treatment to reduce the occurrence of low burst height under very cold conditions are performed during the winter months.

Pre-flight procedures comply with GAW_201.pdf

Expected Precision/Accuracy of Instrument:

PTU values for RS 80 Radiosonde

Pressure:

Resolution 0.1 mb
Accuracy +/- 0.5 mb

Temperature:

Resolution 0.1 C
Accuracy +/- 0.2 C

Humidity:

Resolution 1% RH
Accuracy +/- 2% RH

Geopotential Height:

Uses Pressure and Temperature profile.
Errors due to uncertainty in these values.

Box Temperature:

Resolution 0.1 C
Accuracy +/- 0.5 C

Ozone Partial Pressure:

Resolution 0.01 mPa
Accuracy +/- 10% or less depending on altitude

The main sources of error are the pump correction at high altitudes and background current in the troposphere.

Instrument History:

Project start date: May, 1999

From May 1999 to June 2003: SPC Ozonesondes, model 6A have been used together with radiosondes RS80-15GE and interface cards RSA-11.

From June 2003 to November 2003: ENSCI Ozonesondes, model 2z, have been used together with radiosondes RS80-15GE and interface cards RSA-11.

Since December 2003: SPC Ozonesondes, model 6A.

Radiosonde RS92-SGPW and interface RSA 921 are using since March 2007 until 2019

Both types of sondes have been prepared following the standard operating procedures agreed upon at the NDSC ozonesonde PI meeting in Potsdam in July 1998 and the successive recommendations accepted for Standard Operation Procedures (SOPs) for QUOBI Arctic and Antarctic Match campaigns 2002-2003. A TSC- 1 ozonizer/test unit from Science Pump Corporation has been used for calibration and preparation of the sondes.

Ozonesondes preparation have always followed standard procedures with cathode solution concentration of 1% KI (full buffered), while for the ENSCI the 0.5% KI (half buffered) cathode solution was used.

Box temperatures were measured from the hole in the pump base, and the air flow rate were measured using the conventional soap bubble flow-meter.

Coefficients established by Komhyr [Komhyr 1986] were used for the altitude dependent pump efficiency correction in SPC sondes and Pump flow efficiency factors (PEF) for ENSCI Komhyr (1996)

The background current was considered constant with the altitude. Normalization to Brewer total ozone measurements has not been done, although when Brewer data at the station is available is used as a quality control parameter. Since 2007 the surface ozone monitoring TECO 49C installed is used to check the surface data of the ozonesonde before being launched. If the difference between both instruments is over 10 ppbv, the main ozonesonde parameters is checked as well as TECO data. If there is any doubt about the sonde performance, this sonde is replaced by another one.

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In 2019 was installed new Marwin II, version 41