

## Description JOSIE Data Sets

The **Julich Ozone Sonde Intercomparison Experiment (JOSIE)** data are archived in six different data sets:

1. JOSIE 1996 Data-set
2. JOSIE 1998 Data-set
3. JOSIE 2000 Data-set
4. JOSIE 2002 Data-set
5. JOSIE 2009 and 2010 Data-set
6. JOSIE 2017 Data-set

Plus the **Balloon Experiment on Standards for Ozonesondes (BESOS 2004)** data:

7. BESOS 2004 Data-set for the original processed data by Deshler et al. (2008)

### 1. JOSIE 1996 Data-set

**Sub-folders:**

- I. **JOSIE 1996 Data (GAW Report No.130):**  
Original processed data as described by Smit and Kley, 1998, in WMO/GAW Report No.130.
- II. **JOSIE 1996 Data (Used by Smit et al. 2023 for TRCC)**  
Original processed data as used by Smit et al. in 2023 to develop and test the Time Response Correction and Calibration (TRCC) method to resolve fast and slow time responses inherent in the measured cell current of the ECC-sonde.

### 2. JOSIE 1998 Data-set

**Sub-folders:**

- I. **JOSIE 1998 Data (GAW Report No.157):**  
Original processed data as described by Smit and Sträter, 2004a, in WMO/GAW Report No.157.
- II. **JOSIE 1998 Data (Used by Smit et al. 2023 for TRCC)**  
Original processed data as used by Smit et al. in 2023 to develop and test the Time Response Correction and Calibration (TRCC) method to resolve fast and slow time responses inherent in the measured cell current of the ECC-sonde.

### 3. JOSIE 2000 Data-set

**Sub-folders:**

- I. **JOSIE 2000 Data (GAW Report No.158):**

Original processed data as described by Smit and Sträter, 2004b, in WMO/GAW Report No.158.

**II. JOSIE 2000 Data (Used by Smit et al. 2023 for TRCC)**

Original processed data as used by Smit et al. in 2023 to develop and test the Time Response Correction and Calibration (TRCC) method to resolve fast and slow time responses inherent in the measured cell current of the ECC-sonde.

## 4. JOSIE 2002 Data-set

**Sub-folders:**

**I. JOSIE 1998 Data (GAW Report No.157):**

Original processed data after WMO/GAW Report No.158.

**II. JOSIE 1998 Data (Used by Smit et al. 2023 for TRCC)**

Original processed data as used by Smit et al. in 2023 to develop and test the Time Response Correction and Calibration (TRCC) method to resolve fast and slow time responses inherent in the measured cell current of the ECC-sonde.

## 5. JOSIE 2009 and 2010 Data-set

**Sub-folder:**

**I. JOSIE 2009 and 2010 Data (Used by Smit et al. 2023 for TRCC)**

Original processed data as used by Smit et al. in 2023 to develop and test the Time Response Correction and Calibration (TRCC) method to resolve fast and slow time responses inherent in the measured cell current of the ECC-sonde.

## 6. JOSIE 2017 Data-set

**Sub-folder:**

**I. JOSIE 2017 Data (Used by Smit et al. 2023 for TRCC)**

Original processed data as used by Smit et al. in 2023 to develop and test the Time Response Correction and Calibration (TRCC) method to resolve fast and slow time responses inherent in the measured cell current of the ECC-sonde. These are the same original data processed according ASOPOS 2.0 (WMO/GAW Report No. 268) as used and described in Thompson et al. (2019).

## 7. BESOS 2004 Data-set

**Sub-folder:**

**I. BESOS 2004 Data**

Original processed data as used and described by Deshler et al. (2008)

## Specifications of JOSIE data as used by Smit et al. (2023) for the TRCC method

### Header data:

1. Date=2017-10-11 Date of the Simulation
2. Sim\_Nr=171 Simulation Number
3. Manifold\_Port\_Nr=1 (\*) Port Number of Ozone Manifold in ESC: i=1..4
4. Sonde\_Type=SPC-6A Sonde Type
5. Sonde\_Code=6A33216 Sonde Code
6. SST=SST1.0/1.0 Sensing Solution Type
7. Pump\_Flow\_Rate\_M=4.01 Measured Pump Flow Rate (No wet correction: sccm)
8. Pump\_Flow\_Rate\_Gnd=3.91 Dry Pump Flow Rate (Incl.wet correction: sccm)
9. SS\_Weight\_Losses\_Ascent=1.2 Losses of weight of sensing solution during ascent (g)
10. IB0=0.02 Background current (GC, before ozone exposure:  $\mu\text{A}$ )
11. IB1=0.08 Background current (GC, after ozone exposure:  $\mu\text{A}$ )
12. IB2=0.06 Background current (launch: just before simulation:  $\mu\text{A}$ )
13. Time\_Response\_Fast=21 Fast 1/e response time (seconds)
14. Time\_Response\_Slow=1500 Slow 1/e response time (minutes)
15. Stoichiometry\_Slow=0.051 Stoichiometry factor (I<sub>2</sub>/O<sub>3</sub>) of slow reaction pathway

(\*) In JOSIE 1998 this number is the rising number of the sondes involved.

### Profile data:

- A. Sim\_Time Simulation Time (seconds)
- B. Data\_Index Status Index
- C. Pair\_Pressure\_ESC Pressure air inside the test room of the ESC (hPa)
- D. Tair\_Temperature\_ESC Temperature air inside the test room of the ESC (K)
- E. IM\_Cell\_Measured Measure Cell Current ( $\mu\text{A}$ )
- F. Pump\_T\_Ext External Pump Temperature (K)
- G. Pump\_T\_Int Internal Pump Temperature (K)
- H. Pump\_T\_Cor Corrected Pump Temperature (K)
- I. Absorption\_Eff Absorption efficiency O<sub>3</sub>(gas) into O<sub>3</sub>(liquid)
- J. Pump\_Eff\_Conv Pump efficiency
- K. Conversion\_Eff\_Conv Conversion efficiency O<sub>3</sub>(liquid) into iodine (I<sub>2</sub>)
- L. PO<sub>3</sub>\_Conv Ozone partial pressure sonde by conventional method (mPa)
- M. PO<sub>3</sub>\_OPM Ozone partial pressure by O<sub>3</sub> reference (OPM) (mPa)
- N. Unc\_PO<sub>3</sub>\_Conv Uncertainty of PO<sub>3</sub>\_Conv (mPa)
- O. Unc\_PO<sub>3</sub>\_OPM Uncertainty of PO<sub>3</sub>\_OPM (mPa)

### Sensing Solution Types (SSTZ) of Cathode Cell of ECC-Sonde (GAW Report No.268)

- I. SST 1.0/1.0 1.0% KI and Full Buffer
- II. SST 0.5/1.0 0.5% KI and Half Buffer
- III. SST 1.0/0.1 1.0% KI and 1/10<sup>th</sup> Buffer
- IV. SST 2.0/0.1 2.0% KI and 1/10<sup>th</sup> Buffer
- V. SST 2.0/0.0 2.0% KI and No Buffer (No KBr)

**Note:** Conventional data that data were processed after ASOPOS 2.0 Guidelines (WMO/GAW Report No. 268)

## References:

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Smit, H.G.J., Poyraz, D., Van Malderen, R., Thompson, A.M., Tarasick, D.W., Stauffer, R.M., Johnson, B.J., and Kollonige, D.E.: New Insights From The Jülich Ozone-Sonde Intercomparison Experiments: Calibration Functions Traceable To One Ozone Reference Instrument, *EGUsphere* [preprint], <https://doi.org/10.5194/egusphere-2023-1466>, 2023.

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