

Notes of the COCCON EM27/SUN meeting at January 18th 2024

Here are some notes of the discussions and ideas of the telecon.

Please note that these notes are not a complete record. Rather it tries to sum up the most important points of the discussion. Furthermore, no liability is taken in case of any misunderstandings.

However, if you think an important point is missing please email to benedikt.herkommer@kit.edu.

List of participants:

Andrè Achilli (CNR-ISAC), Carlos Alberti (KIT), Corinne Boursier (Sorbonne University), Stefano Casadio (ESA), Elisa Castelli (Italian National Research Council), Jia Chen (TU Muenchen), HajarEl Habchi El Fenniri (University of Reims), Lena Feld (KIT), Matthias Frey (NIES), Giacomo Gostinicchi (Serco Italia), Frank Hase (KIT), Katharina Heimerl (Vrije Universiteit Amsterdam), Benedikt Herkommer (KIT), Neil Humpage (University of Leicester), Pascal Jeseck (Sorbonne University), Tomi Karpainen (FMI), Jueun Kim, Rigel Kivi (FMI), Benedikt Löw (IUP Heidelberg), Gregory Osterman (JPL), Enzo Papandrea (ISAC), Hayoung Park (Seoul National University), Dave Pollard (NIWA), Eliezer Sepulveda (TRAGSATEC-AEMET), William Simpson (University of Alaska, Fairbanks), Elisabeth Spicer (University of Oklahoma), Noemi Taquet (TRAGSATEC-AEMET), Yao Té (Sorbonne University), Jerome Woodwark (University of Leicester)

1) Presentation of a commercial by Jerome Woodwark

- How long does it take to produce an enclosure?
 - The crucial point is the dome. This can take several month.
 - Furthermore the dome is the most expensive part. When ordering a greater amount they become cheaper.
- Is it possible to use it in an different than the European power grid?
 - Should be possible, but not 100% sure.
- Which SZA range can be covered?
 - Up to 80 degree.
- Is there an estimated lifetime of the enclosure, and especially, the dome?
 - This setup is run by University of Leicester for 2 year. They have not experienced a degradation so far.
 - The dome gets a bit dusty and must be cleaned from time to time.
 - The cover of the dome prevents washing effects when it rains.
- Which ambient temperature can be handled by the enclosure?
 - So far it was tested in London with up to 39 degrees.
 - If cooling units are not sufficient, further cooling units may be added.
- Why are the boxes black? Leads to additional intake of thermal energy.
 - The boxes are not available in an other color.
 - There are thoughts to solve this with foils. But is ongoing.
- Comment: A glass dome is an additional optical layer. It would be a good selling argument to do measurements with and without dome to see the difference.
- Comment Frank Hase: The BK7 material of the glas dome is very robust. He does not expect optical degradation from this.

2) Presentation by Carlos Alberti: Improved Calibration Procedure of EM27/SUN

- How stable are the correction factors (K)?

- Quite stable. Can be seen good in the Berlin Campaign Paper (Haset et al. 2015)
- The error bars at the shown plot are the standard deviation is several measurements are available.
- Is it important to track the ILS? And if yes how often?
 - When the instrument is in a good shape and not transported twice a year should be sufficient.
 - When transporting, it is recommended to check after each transport.
 - The best practice is to use XAIR as an indicator. If nothing changes there, the instrument is fine (under the presumption that the pressure measurements are correct).
- When an EM27/SUN is send to Bruker for maintenance, is it automatically send to KIT also?
 - No, if you wish this, you should tell Bruker.
- Is the distance of the lamp changed when using a gas cell?
 - No.
- When the gas cell is used, the ILS is a bit different. Why is this? Should not it be equal?
 - The difference is mainly due to the spectroscopic data of water vapor which is not sufficient.
 - The other effect arises from the pressure broadening of the gas in the cell.
 - The C2H2 cell is more accurate. Especially there is less noise due to lower pressure in the cell.
 - However, the open path measurements are more flexible.