

Notes of the COCCON EM27/SUN telephone conference at August 24th 2023

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:

Saswati Das (JPL), Wolfgang Stremme (UNAM), Luis Gutierrez (UNAM), Michel Grutter (UNAM), Tomi Karpinnen (FMI), Aaron Meyer (LANL), Elisabeth Spicer (University of Oklahoma), Matthäus Kiel (JPL), Benedikt Hemmer (IUP Heidelberg), Annmarie Eldering (NIST), Jonathan Franklin (Harvard University), Neil Humpage (University of Leicester), Young Suk Oh (NIMS), Bill Simpson (University of Alaska, Fairbanks), Chis O'Dell (Colorado State University), Hajar El Habchi El Fenniri (University of Reims), David Noone (University of Auckland), Jia Chen (TUM), Haoyue Tang (TUM), Nasrin Pak (University of Toronto), Frank Hase (KIT), Benedikt Herkommer (KIT)

1) Presentation by Luis Gutierrez and discussion afterward:

- Comments:
 - In his group they are also measuring landfills. They found that there is a high variability even from day to day with different orders of magnitudes.
 - An idea could be to filter for the days where the wind comes from the landfill to see a clear signal.
- Question: Is the dispersion parameter (size of dispersion along y axis, parameter alpha) pre-adjusted or does it depend on the wind speed?
 - The same value is used for all measurement days.
- Question: The used model is very advanced. Did you try to use a simpler model as well?
 - Yes a simpler model was the first attempt. However, this did not work.
- Question: Have you considered the slant column which is the case for the low solar elevation (morning and evening)? Y dispersion coefficients will also then depend on height z:
 - No, that was not considered. However, it is a good idea and will be tried.
- Question: Is it correct, that only a single instrument has been used? More instruments give more information and might help.
 - Yes, this is correct. In future work more instruments will be considered.

2) General information discussion about EM27/SUNS:

Aaron Meyer (LANL): EM27/SUN in hot environment:

- At LANL they operated the EM27/SUN at outside temperature up to 37 degree Celsius.
- Worked well, however, they think that this is the limit.
- If someone else have made experience with hot temperatures and wants to share experience or ideas how to cool down contact Aaron Meyer: agmeyer4@gmail.com

Frank Hase (KIT): Laser Failure:

- In the last time the first EM27/SUNs started to show laser failures. This is a normal wear part.
- Furthermore, there is an issue in early spectrometers which appears as a laser failure in OPUS but is not: There is spacer which is made out of plastic and in newer versions out of metal. When this breaks this can be replaced by Bruker.

- Question: Does it help to switch it off to have a longer laser lifetime?
 - No, this is not the case. Bruker has a lot of experience with this.