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Comment on amt-2022-292

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Community comment on "Performance evaluation of the Alphasense OPC-N3 and Plantower PMS5003 sensor in measuring dust events in the Salt Lake Valley, Utah" by Kamaljeet Kaur and Kerry E. Kelly, Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2022-292-CC1>, 2022

This evaluation of the OPC-N3 for PM10 during wind blown dust episodes is both timely and valuable. FYI, the Great Basin APCD headquartered in Bishop, California, is starting to evaluate the OPC-N3 sensor within the Alphasense monitor for wind blown dust PM10 at Keeler, next to the Owens dry lake, and at Mono Lake. I have contacts if you're interested.

A minor correction to your preprint - - on lines 61-63 it states that some low cost sensors are ineffective at measuring PM10 and dust, primarily due to the sensor's inability to aspirate these larger particles into the device, and cites our paper by Ouimette (2022). In our paper we did not state that poor aspiration efficiency was the primary reason for the coarse particle inefficiency. Based on the Plantower PMS5003 particular geometry our physical-optical model predicted an 80-90% reduction in the 2-um particle scattering coefficient compared to a perfect nephelometer, due to truncation of the forward scattering signal. However, the lab data showed more like a 95% reduction in 2-um light scattering. Based on Willeke and others' work we hypothesized that poor aspiration efficiency could be a reason for this additional 5-15% loss. But we neither modeled nor measured it for that paper. It's extremely difficult to measure aspiration losses for the PMS5003 because any measurement slows or stops its flow rate due to Δp across the little fan.

I hope this helps. Best wishes on your paper review.

Regards,

Jim Ouimette