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Atmospheric Measurement Techniques Discussions

Interactive comment on "Recent improvements of Long-Path DOAS measurements: impact on accuracy and stability of short-term and automated long-term observations" *by* Jan-Marcus Nasse et al.

Anonymous Referee #3

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The paper presented by Jan-Marcus Nasse et al. has reported the some recent improvements, i.e. application of a new type of light source and consequent changes to the optical setup, of LP-DOAS measurements to improve the accuracy and stability of short-term and automated long-term observations. In general, it's clear written but not well organized, since the paper length is not in keeping with its importance. I suggest to shorten the paper to some extent. The presented improvements show high attractions to LP-DOAS and related community. It is worthy to be published after some minor revisions.

Specific comments:

P2 L5, I suggest to include some other important atmospheric active species, e.g. HONO, NO3, which made the LP-DOAS technique wide influences in the urban pollution research, along with the related references.

P5 L23-25, Please re-structured this long sentence to be easily understood. "And residuals attained in this study still were a factor 2-4 larger than pure photon shot noise" described the status before improvement or after? Not so clear.

P11 L4, 800 μm diameter

P18 Line 7, "ar" to "are". In this paragraph, I am not so clear about the "spectra summation". During the experiment, the spectra was sampled in 60s temporal resolution during the 10 hours. The spectra at 10 min, 60 min and 600 min were added with the measured spectra offline? Or the summation was performed during the sampling before the related spectra was recorded.

Fig. 8, Because the LP-DOAS measurements are usually expected to be applied with high temporal resolution e.g. $\sim$ min. Why the authors test with such long periods? I think exam the RMS dependency on the temporal stability of different mode mixing methods should be focused on the even shorter duration of the spectra summation.

P24-27, It's better to shorten the conclusions part, such as Fig. 10, 11 and related detailed description can be moved to the Sect. 5.

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