

Atmos. Chem. Phys. Discuss., community comment CC1
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Comment on Myers et al. by Meinrat O. Andreae

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Community comment on "Sulfuric acid in the Amazon basin: measurements and evaluation of existing sulfuric acid proxies" by Deanna C. Myers et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-166-CC1>, 2022

Upon reading this interesting paper, I would like to share some concerns:

- The measurement site near Manacapuru is located downwind of the city of Manaus, and is thus alternatingly within the Manaus urban plume or in background air with only minor anthropogenic inputs. Trace gas and aerosol concentrations vary greatly between these conditions, as shown by Kuhn et al. (2010; not cited here) and several papers from the GoAmazon team. One would thus expect to find different concentrations of the species discussed here and it would seem essential to me to discuss these conditions separately.
- In the Methods section, the detection limit of the SO₂ analyzer is given as 2.4x10⁸ cm⁻³. As 1 ppt corresponds to about 2x10⁷ molec cm⁻³ at sea level, this would correspond to about 12 ppt. In contrast, the detection limit given by the manufacturer is 0.1 ppb, and that stated in Springston (2016) is 0.3 ppb for 60 sec averages. The SO₂ concentrations in Table 2 show median values around 1.5x10⁹, or about 75 ppt, which would be well below the stated detection limit of the instrument.
- In their comparisons with previous work at other sites, the authors use the term "consistent". It is not clear to me what "consistent" means in this context. Do they mean comparable, identical, similar? Would a factor two difference still be consistent? I recommend that instead of using such vague terminology, the authors provide quantitative comparisons, ideally in the form of a table.
- Line 160 and elsewhere: Rcia et al. (2000) should be Yamasoe et al. (2000).
- Line 159ff: Note that the differences between wet and dry seasons were not "hypothesized" by previous authors, but based on measurements. This has been documented in numerous publications (Artaxo et al., 2002; to name just a few; Andreae, 2009; Martin et al., 2010; Andreae et al., 2015). The lesser interseasonal difference observed here may be related to influence of pollution from Manaus, which is present year-round.

Andreae, M. O., Correlation between cloud condensation nuclei concentration and aerosol optical thickness in remote and polluted regions: Atmos. Chem. Phys., 9, 543–556, 2009.

Andreae, M. O., Acevedo, O. C., Araujo, A., Artaxo, P., Barbosa, C. G. G., Barbosa, H. M. J., Brito, J., Carbone, S., Chi, X., Cintra, B. B. L., da Silva, N. F., Dias, N. L., Dias, C. Q., Ditas, F., Ditz, R., Godoi, A. F. L., Godoi, R. H. M., Heimann, M., Hoffmann, T., Kesselmeier, J., Konemann, T., Kruger, M. L., Lavric, J. V., Manzi, A. O., Lopes, A. P., Martins, D. L., Mikhailov, E. F., Moran-Zuloaga, D., Nelson, B. W., Nolscher, A. C.,

Nogueira, D. S., Piedade, M. T. F., Pohlker, C., Poschl, U., Quesada, C. A., Rizzo, L. V., Ro, C. U., Ruckteschler, N., Sa, L. D. A., Sa, M. D., Sales, C. B., dos Santos, R. M. N., Saturno, J., Schongart, J., Sorgel, M., de Souza, C. M., de Souza, R. A. F., Su, H., Targhetta, N., Tota, J., Trebs, I., Trumbore, S., van Eijck, A., Walter, D., Wang, Z., Weber, B., Williams, J., Winderlich, J., Wittmann, F., Wolff, S., and Yanez-Serrano, A. M., The Amazon Tall Tower Observatory (ATTO): overview of pilot measurements on ecosystem ecology, meteorology, trace gases, and aerosols: *Atmos. Chem. Phys.*, 15, 10723-10776, doi:10.5194/acp-15-10723-2015, 2015.

Artaxo, P., Martins, J. V., Yamasoe, M. A., Procópio, A. S., Pauliquevis, T. M., Andreae, M. O., Guyon, P., Gatti, L. V., and Leal, A. M. C., Physical and chemical properties of aerosols in the wet and dry seasons in Rondonia, Amazonia: *J. Geophys. Res.*, 107, -, doi:10.1029/2001JD000666, 2002.

Kuhn, U., Ganzeveld, L., Thielmann, A., Dindorf, T., Schebeske, G., Welling, M., Sciare, J., Roberts, G., Meixner, F. X., Kesselmeier, J., Lelieveld, J., Kolle, O., Ciccioli, P., Lloyd, J., Trentmann, J., Artaxo, P., and Andreae, M. O., Impact of Manaus City on the Amazon Green Ocean atmosphere: ozone production, precursor sensitivity and aerosol load: *Atmos. Chem. Phys.*, 10, 9251-9282, doi:10.5194/acp-10-9251-2010, 2010.

Martin, S. T., Andreae, M. O., Artaxo, P., Baumgardner, D., Chen, Q., Goldstein, A. H., Guenther, A., Heald, C. L., Mayol-Bracero, O. L., McMurry, P. H., Pauliquevis, T., Pöschl, U., Prather, K. A., Roberts, G. C., Saleska, S. R., Dias, M. A. S., Spracklen, D., Swietlicki, E., and Trebs, I., Sources and properties of Amazonian aerosol particles: *Rev. Geophys.*, 48, RG2002, doi:10.1029/2008RG000280, 2010.

Yamasoe, M. A., Artaxo, P., Miguel, A. H., and Allen, A. G., Chemical composition of aerosol particles from direct emissions of vegetation fires in the Amazon Basin: water-soluble species and trace elements: *Atmospheric Environment*, 34, 1641-1653, 2000.