

Review of Eguphere-2024-549

This is an interesting study to gain the knowledge about COS anthropogenic and biogenic emissions from the single atmospheric mixing ratio measurement site at GIF, France. The manuscript is well constructed and well written and the methodology to analyze the emission inventories and comparison with COS measurements is excellent. The study contributes new knowledge to COS measurement and modelling studies; therefore, I recommend publication after minor revision.

1. How is the measurement error, data quality and quality control of COS at GIF and comparison with COS measurement other locations? Please discuss them in the section of method, and/or in the discussion.
2. The analysis did not consider biomass burning emissions from COS. Why is that?
3. The authors compared two anthropogenic emission inventories. Is it possible to compare them on the same scale? For example, to compare Fig. 2a and Fig. 2c on the same unit, and estimate the total emissions at the same region.
4. DMS is also an important precursor of COS. Is there any industrial production of DMS that can explain some of the overestimated COS measurement at GIF?

Minor comments and technical corrections:

Page1, Line 3: "Moreover, COS atmospheric mixing ratio data are still too sparse to evaluate the estimations of these sources and sinks." While it is true that the COS mixing ratio data are sparse, but the evaluation of COS sources and sinks are always possible, e.g. using inverse model and satellite data assimilation.

Page 1, Line 4: "in the footprint a measurement site" to "in the footprint of a measurement site".

Page 1 Line 12: "ORCHIDEE" to "land surface model ORCHIDEE".

Page 1, Line 17: (Whelan et al., 2018, and references within), this I suggest to cite important papers explicitly.

Page 1 Line 17: "thinking" to "suggestions".

Page1, Line 20: here the authors introduced inverse method, but there are already a few studies of COS inversions. I recommend proper citations here.

Page 3 Line 6: "GgS/y" to "GgS.yr⁻¹" to keep consistency with other units. And elsewhere.

Page3 Line 17: "Remaud et al. (2023)" to "Remaud et al. (2023) and Ma et al. (2021)".

Page 3 Line 22: It is suggested to cite Montkza et al. (2007) here.

Page 6 Line 9: "horizontal resolution" to "horizontal resolution, respectively."

Page 6 Line 14: "GgS/y" to "GgS/yr". Please fix this unit throughout the text and keep them consistent.

Page 6 Line 21: "respectively)." to "respectively."

Page 6 Line 24: "1 degree × 1 degree" to "1°×1°", in order to keep consistent.

Page 6 Line 28: "The difference performance of our model with monthly and 3-hourly fluxes is evaluated in Sect. 3.1.". Maybe refer to "the different performances of our model with monthly and 3-hourly fluxes are evaluated in Sect. 3.1."

Page 7 Line 4: "GgS", is it "GgS /yr" for the year 2012?

Page 7 Line 22: "in Tab. 2-3 of Belviso" to "in Table 2-3 of Belviso", and elsewhere.

Page 8 Line 11: "Barnes et al. (1994)". This paper discussed DMS conversion rate to COS about 0.7%. It is not about CS₂ conversion to COS.

Page 8 Line 15: "So called" to "So-called".

Page 8 Line 16: "above ground." to "above ground level."

Page 8 Line 19: "(Tab. 1)" to "(Table 1)".

Page 10 Line 20: "coarse a variability" to "coarse variability".

Page 11 Table 2: "Background + coal (HM) + viscose (HM)" shows slightly larger bias and RMS, and smaller correlation than "Background + coal (HM)" or "Background + viscose (HM)". Does this indicate the sum of coal and viscose from HM inventory is less accurate than single coal or viscose?

Page 16 Line 2: "Zanchetta et al., 2023" to "Zanchetta et al., (2023)".

Page 16 Line 12: "Ramonet et al., 2011" to "Ramonet et al., (2011)".

Page 16 Line 16: "(Remaud et al., 2023)" to "Remaud et al., (2023)".