

Review: Distribution of hydrogen peroxide over Europe during the BLUESKY aircraft campaign, Hamryszczak et al.

The manuscript presents in situ aircraft measurements of hydrogen peroxide and organic peroxides during the BLUESKY campaign in May and June of 2020. The time period coincides with reduced emissions associated with shutdowns driven by the COVID-19 pandemic. The authors use a series of models to make the case that cloud scavenging and rainout processes over the region had a greater impact on reducing ambient peroxide levels than a reduction in emissions. The analytical methods used are sound. The data set is a valuable contribution and the manuscript is well written, and may be ready for publication with the following clarifications.

Line 137 states the CPI inlet sampling efficiency for hydrogen peroxide was determined to be 0.52. It would be helpful to know how this was determined and the frequency. Was the inlet cleaned during the campaign, and did this impact the transmission efficiency? Was the transmission efficiency examined for organic peroxides?

Line 150, notes an assumption that organic peroxides that pass the inlet are unaffected by any further losses and assumes a stripping efficiency for MHP from Lee et al., 2000. The manuscript would be strengthened if loss of organic peroxides in the sampling system were characterized. However short of that details regarding the stripping system should be provided to establish whether adopting the Lee et al stripping efficiency is appropriate.

Line 154, change "...to a lesser extend of..." to "...extent PAA..."

The analytical method used measures H_2O_2 and organic peroxides (RO_2H). The case is made that the RO_2H is likely, largely MHP. However, the technique does not distinguish the different organic peroxides. I recommend using RO_2H in figure 3 and through out the manuscript. This will not detract from the arguments presented in the manuscript and will not lead to an impression that MHP was a measured species.

Line 173 notes an instrument interference caused by hopcalite contamination during the campaign. Can the authors discuss this interference? Was this interference dependent only on ozone concentrations? Did this have an impact on the RO_2H channel?

Section 4.3 discusses the fate of peroxides below clouds. This section could benefit from providing some information and discussion about whether the airmasses sampled above and below the cloud deck have different trajectories and exposure to rain out. When did drizzle begin in the boundary layer relative to the measurement time?