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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "A large and ubiquitous source of atmospheric formic acid" *by* D. B. Millet et al.

**Anonymous Referee #2**

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Millet et al add to a growing body of literature which indicates a substantial gap in our understanding of the atmospheric budget of formic acid. Using three different observational datasets, all from the USA, they show that summer time boundary layer mixing ratios of formic acid are substantially overestimated by a state of the art model, often by over a factor of two. The paper provides a very thorough overview of the relevant literature, covering both field observations and laboratory data. Several proposed mechanisms are tested regarding their ability to improve the model-measurement agreement, with none of these proving completely satisfactory in terms of its ability to improve the simulation of formic acid mixing ratios. The results, taken together with the previously published literature, indicate a large and ubiquitous source of formic acid, produced during the atmospheric degradation of all classes of volatile organic compounds,

through some as-yet unknown mechanism. Millet et al emphasise the role of biogenic sources in their analysis, but since much of the data they analyse is dominated by emissions of biogenic VOC, I wonder whether this is simply due to the fact that biogenic VOCs tend to react more quickly than anthropogenic VOCs (eg. alkanes), and would therefore produce formic acid at a faster rate.

The paper is clearly structured and very well written. While it does not produce substantial new insight, it nevertheless has value due to its comprehensive review of the literature and systematic sensitivity analysis of several proposed mechanisms of formic acid production. I only have one very minor comment: I think the paper can do without Figure 2. The discussion of this figure is minimal, and it does not add much value to the paper.

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