

## ***Interactive comment on “HCOOH measurements from space: TES retrieval algorithm and observed global distribution” by K. E. Cady-Pereira et al.***

### **Anonymous Referee #2**

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Cady-Pereira and co-authors present a detailed description of the satellite retrieval strategy for HCOOH from the TES instrument, global HCOOH distributions, and preliminary comparisons with the GEOS-Chem CTM. Particular emphasis has been put on the challenges of satellite HCOOH retrievals. The retrieval methodology is sufficiently detailed and the choices made are adequately justified. The results appear to be correct and the conclusions are supported by the analysis. This work is interesting and meets the AMT criteria for publication. I believe, however, that the manuscript would benefit from a number of changes, additions and clarifications as suggested below.

- The HCOOH derived from TES is presented in the abstract as “broadly consistent” with that simulated by GEOS-Chem (p.1976, l.14), whereas the model  
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appears to have a “dramatic low bias compared to TES” (Section 4, p.1989, l.25).  
Could you align the statements?

- Please consider making some comparison between TES HCOOH and HCOOH derived from IASI. A discussion on the respective skills and limitations of the instruments for HCOOH retrievals would be appreciated.
- The model description is very limited. Consider adding more description for HCOOH simulated by GEOS-Chem. The authors refer to recent model updates by Chaliyakunnel et al. 2014, but I could not find this paper in the bibliography. One would like to know about the emissions and the sinks of HCOOH in the current GEOS-Chem version.
- It is suggested to include more quantitative comparisons between modeled and observed concentrations. Figure 14 does not help much, so it might be useful to include time series of modeled/observed concentrations over large regions. Restricted over biomass burning regions, such comparisons should help to confirm (or not) the argument for the existence of a large pyrogenic source of HCOOH.
- It would be useful to include some well-known major fire events as case studies - like the Russian fires in July-August 2010 and/or in Amazonia in September-October of the same year. R'Honi et al. (2013) observed exceptionally high HCOOH columns by IASI during the Russian fires. How does TES compares with IASI HCOOH during these episodes?

Y. R'Honi et al. Exceptional emissions of NH<sub>3</sub> and HCOOH in the 2010 Russian wildfires, Atmos. Chem. Phys., 13, 4171-4181, 2013