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***Interactive comment on* “Observations of ozone production in a dissipating tropical convective cell during TC4” by G. A. Morris et al.**

Anonymous Referee #2

Received and published: 5 October 2010

This work focuses on analyzing a unique set of ozonesonde observations obtained during the TC4 field campaign. A sonde was observed to oscillate vertically in a dissipating convective cell over a two hour period, providing valuable information on the evolution of ozone during and following an electrically active thunderstorm. Based on several types of data, the authors use different methods to estimate ozone production and its associated uncertainty. Because large uncertainties exist in our understanding of lightning photochemistry, this work is very relevant to ACP and should be of great interest to readers. In addition, the analysis presented is exceptionally thorough and well reasoned. I recommend publication of this work with some minor revisions suggested below.

The authors go to great lengths to analyze different types of available and relevant

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observations and to identify and evaluate potential sources of uncertainty. This is well done, but so much information is presented that I think it may be hard to follow at times, especially for casual readers. I would recommend adding a short paragraph or two to the beginning of Section 3 that would introduce how the different observations types are used together. For example, 'Because of the uncertainty in lightning flash rates detected by the WWLLN, we use several methods to estimate ozone production by lightning. In Section 3.1, we estimate these quantities based on NPOL radar observations while in Section 3.2, WWLLN data are used. In Section 3.3, we present an estimate based on OMI NO2 data...'

Figure 13 and the discussion on p. 18971 seems out of place to me because it occurs after the discussion of photochemical modeling. Would it be possible to move this to section 3 or add a sentence or two connecting it to the preceding paragraph?

I also agree with the comment of Anonymous reviewer 1 that the authors should give more guidance on a most likely scenario to tie the paper together and deliver a more cohesive message.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 18953, 2010.

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