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Comment

## ***Interactive comment on “Optimization of the GSFC TROPOZ DIAL retrieval using synthetic lidar returns and ozonesondes – Part 1: Algorithm validation” by J. T. Sullivan et al.***

### **Anonymous Referee #2**

Received and published: 31 July 2015

The paper, according to the authors, is the first of a series of papers that deals with the optimization of the GSFC TROPOZ DIAL. The authors present in this paper an improved algorithm and they validate their improved algorithm using synthetic data. This allows them to quantify the effect of the changes and/or improvements, independent of the accuracy of validation data such as ozonesondes. The paper is well structured and written and is suitable for AMT and thus can be accepted for publication, after considering few remarks listed below.

It would good if the authors summarize in a table the main differences between the old and the optimized algorithm.

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The authors should emphasize more that the paper mainly aims to validate changes in an algorithm and not to validate real DIAL data, processed with a new algorithm. In some cases the reader is confused what to expect.

Section 3. The authors should provide more details how (e.g. provide some equations) they compute the synthetic data. They mostly mention what are the input data they are using rather than explaining how the computations are made. They just provide a reference to an empirical model for the estimation of the atmospheric state. It would be better to describe some basic steps of the calculations in the manuscript since the use of synthetic data is a key issue in their paper.

Section 3.2 The authors should eventually also examine, or at least discuss, the use of the different data sets concerning the ozone cross sections that were considered in ACOS study coordinated by WMO (see WMO GAW report 218).

Section 3.3 It is not clear what is new in this section. Did the authors consider improved new Rayleigh extinction cross sections or they just quantify the effect of using them in the correction form?

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Interactive comment on Atmos. Meas. Tech. Discuss., 8, 4273, 2015.

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