

## ***Interactive comment on “Synergy between CALIOP and MODIS instruments for aerosol monitoring: application to the Po Valley” by P. Royer et al.***

### **Anonymous Referee #2**

Received and published: 3 May 2010

Overall quality evaluation:

The paper is on the determination of aerosol extinction coefficient profiles and aerosol optical depth derived from CALIOP data over the Po valley being constrained by the aerosol optical depth derived from MODIS Aqua and Terra data.

The overall quality of the paper is quite poor, as the paper is based on a wrong concept: the derivation of the aerosol extinction profile based on lidar backscattered CALIOP data, assuming a priori “guessed” 1/lidar ratios. The correct concept to derive the aerosol extinction profile is to use ONLY specific techniques, such as multi-wavelength Raman, multi-angle or High Spectral Resolution lidar systems. Therefore, it is not

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acceptable, scientifically speaking, to present aerosol extinction profiles of CALIOP, based only on backscatter data and AOD data derived from MODIS or AERONET measurements.

The only acceptable aerosol extinction profile from CALIOP is derivable from CALIOP backscatter data, CALIBRATED using as input LR profiles derived from one of the above-mentioned techniques. This has already been done in the frame of ground-based lidars, as appeared in several papers validating the CALIOP profiles (i.e papers appearing in AMT and JGR) in 2009 and 2010.

Therefore, the authors should re-orient and re-perform their research using, for example, lidar data from multi-angle measurements they are able to perform over the studied area. This proposed approach will help them to reduce the uncertainty in the derived LR values and increase the correlation coefficients between the inter-compared aerosol data.

Open scientific questions/issues:

I would like to express my full agreement with the comments and issues raised by Referee 1 (posted on April 16, 2010). These comments corroborate most of my arguments expressed, in the previous paragraph, in the quality evaluation of the paper. Therefore, I would not like to add more comments on these scientific issues.

Suggestions for corrections:

BER values (used only by some members of the French lidar community) should not be used any more and should be replaced by the Lidar Ratio (LR). It makes no sense to use the term BER, which is greatly confusing within the lidar community, which has long ago, adopted the LR values expressed in (sr).

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Interactive comment on Atmos. Meas. Tech. Discuss., 3, 1323, 2010.

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