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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "A conceptual framework to quantify the influence of convective boundary layer development on carbon dioxide mixing ratios" *by* D. Pino et al.

**Anonymous Referee #1**

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This manuscript presents scientifically interesting investigations of the relationship between the boundary layer dynamics and the $CO_2$ budget in convective conditions. The results are very interesting and provide valuable information. The title clearly reflects the article and the abstract shows its content. The results are clear and in a logical sequence. However, some revisions should be addressed before recommending acceptance of this manuscript.

page 32771 lines 1-6: The introduction reports very well the author's hypothesis. However, in my point of view the introduction should be more related to "state of the art". Therefore, this part should be improved by the "state of the art" analysis. I found some

general sentences in the beginning, but the text suffers from not citing the works related to the topic.

page 32774 line 5: This point results from the previous remark. It is widely accepted, that the quantification of $CO_2$ exchange must include measurements of atmospheric storage, flux divergence and advection. It is for sure difficult to assess the advection terms over the measuring site. However, in the last decade there were many experiments addressing the advection problem and improving the results. These works should be cited to figure out the advantages and disadvantages of the proposed analysis.

page 32780 line 14: The experimental design is well presented in the article. However, only one day of data was used. Did the authors analyzed other case studies? More data should make the results look more consistent.

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Interactive comment on Atmos. Chem. Phys. Discuss., 11, 32769, 2011.