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## ***Interactive comment on “In situ study of particle growth in convective eddies of the planetary boundary layer” by B. Alfoldy et al.***

**Anonymous Referee #2**

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This manuscript by Alfoldy et al., entitled "In situ study of particle growth in convective eddies of the planetary boundary layer" presents data set from a measurement flight. While this data set from varying altitudes and conditions is very interesting, the analysis and discussion unfortunately is not very thorough and convincing.

It seems like the approach was to plot the data as time series and pick up few of those cases only (not analyzing them all) that show a pattern that could be explained by particle growth or cloud droplet formation. Unfortunately, the reader does not get very convinced then with the two main conclusions of this study: 1) "The simultaneous increase of concentration and decrease of average diameter of ultrafine particles CAN be considered as an INDIRECT sign of formation and/or growth of new particles". 2)

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"Thus, the observed particle loss CAN be an an INDIRECT sign of cloud droplet formation". Reader is left with the understanding that there could be these indirect signs involved, as suggested by the authors, but they could be as well due to some other differences in the conditions that were not addressed.

That is the main problem with the current form of this manuscript. However, it is not necessarily easy to suggest in detail how to improve, without knowing the possible ancillary data available for the authors, to strengthen their analysis. For instance, better info about the land use patterns and emission strengths under different thermals might be of interest.

The least the authors should do, is to analyze the data more thoroughly, with all the altitude changes (thermals) and corresponding changes in particle concentrations and particle sizes and discussing the patterns and not only those that can show a desired indirect sign of particular phenomenon. The measurement uncertainty issues also could be likely further discussed. For instance, in Figure 3 during the cloud passage, the change in 350-400nm is very small - given the measurement uncertainty, is it really a significant?

To summarize, if the analysis cannot be strengthened by including some additional supporting data, it is important that the authors at least carry out the existing analysis more thoroughly. Essentially so that it includes all the possible cases, not only few. Then, it likely turns out actually, that more often an opposite effect is seen (that in those selected for the analysis now). Then, it is important to discuss the possible reasons for those cases (e.g. different emission sources from below).

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Interactive comment on *Atmos. Meas. Tech. Discuss.*, 4, 6969, 2011.

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