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Interactive Comment

Interactive comment on "The daytime mixing layer observed by radiosonde, profiler, and lidar during MILAGRO" by W. J. Shaw et al.

Anonymous Referee #1

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A) General comments

This paper in the present form need to improve the included science to be acceptable for ACP. If it still really interesting for scientist working on MILAGRO campaign as a report on some dynamical fields as the boundary layer, winds evolution. But authors need to connect their results to atmospheric processes.

The first part of the paper discussion concerning the differences between the evolution of the boundary layer measured by dropsonde, Lidar, profilers and sodar is interesting for a teach but not for a scientific paper: the quality and the default of each instrument is well known in meteorology since 20 years. The second part of the paper treating of the evolution of boundary layer, wind field during MILAGRO campaign need to be develop,



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to be a real help for scientist who works on aerosols and meteorological models. The present form of the paper look more to a description of the observations rather than an detailed analysis of their results. I suggest a major correction according to some of these two main comments:

1) Comparing the quality and default of dropsonde, lidar, profilers and sodar for the ABL could be interesting to people not familiar to these instruments, but not new. I suggest summaries the section 3, choosing the most interesting figures, as an help to understand the observations detailed in the scientific part of the paper.

2) The Mexico area is characterize by many atmospheric processes such as sea air mass sea advection (synoptic condition), catabatic winds from mountains (regional) and urban breeze (local). I think the location of stations T0, T1 and T2 are really good to interpret the observations in terms of specific meteorological conditions that could be helpful for the interpretation of atmospheric chemical and aerosols processes. I suggest to split the MILAGRO campaign in different specific period in which the author detailed their observations to show the transport and possible re-circulation of gas and aerosols. Try to connect the origin of verticals layer observed by LIDAR, with atmospheric motions (fire, re-circulation due to urban breeze or from the mountains). Authors could use meteorological analysis for the synoptic view, and if they can, back trajectories from CRM regional models. I suggest also to use more the wind profilers informations. One can observed some period where the wind direction remain from the 180 degrees (18 March to 20 March), and in some period, particularly when the wind intensity decrease, there is an oscillation of the direction between 180 and 360 degrees. Is it due to catabatic wind or urban breeze? The temperature gradient between T0 and T2, could drive some urban breeze motions when the wind intensity is low (the upper wind branch of the urban breeze circulation cannot be found at 1500 meters in the middle of the ABL but in the top of ABL near 3000m during day). Thus, to show urban breeze; could you make differences of wind profile between T0, T1 and T2.

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Interactive Comment

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Interactive Discussion

Discussion Paper

B) Specific comments: Some figures are not necessary: I don't understand the real interest of fig 5, or comment more in the text what do you want to show. The figure 8 could be in a table or the occurrences can be simply mention in the text. Use references recent regional pollution campaign (IHOP, ESCOMPTE, PIPAPO, HEAT,), and paper using LIDAR, Profilers..

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 15025, 2007.

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