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Interactive comment on "How much is particulate matter near the ground influenced by upper level processes within and above the PBL? A summertime case study in Milan (Italy)" *by* G. Curci et al.

Anonymous Referee #2

Received and published: 22 November 2014

This manuscript combines observations and modeling to interpret the vertical profile and budget of aerosol over Milan. The study is clear and thorough and provides some interesting insights about the vertical profile of nitrate. I have only minor comments below. However the article does need to be edited for language prior to publication (numerous grammatical and phrasing errors).

1. Abstract, lines 19-23: These results are somewhat overstated given that they are based on one event, and not necessarily generalizable. I suggest clarifying that num-

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bers in particularly are based on the one case study examined here.

2. Page 26411, lines 9-11: what size ranges do the 2 submicron modes cover?

3. Page 26413: lines 5 and 17: please comment on why differing OM:OC ratios (1.6 and 1.8) are applied.

4. Page 26413, lines 7-9: how far away are the weather and monitoring stations from the aerosol measurement site?

5. Page 26415, lines 20-21: what types of SOA are included in the simulation?

6. Page 26415, line 19: the name of the thermodynamic model is MAR-A not RP-MARES

7. Page 26417, lines 3-5: Has this model been validated using TNO emissions? If so please include references.

8. Page 26420, lines 25-29 & page 26422, lines 17-22: Please comment on how the lack of dust in the model may impact the comparison to observations.

9. Page 26423, lines 8-9: Please comment/explain the poor model performance for nitrate shown in Figure 5.

10. Page 26423, line16: what kind of SOA? Biogenic? Anthropogenic? From where?

11. Page 26423, lines 20-29: comment on how the model compares to th elidar profiles

12. Figure 7: color scale makes it difficult to see features. I suggest different color bars be used for different panels, as appropriate

13. Page 26424, line 11: what do you mean by primary? Only those emitted particles? Is this BC and POA in your simulation? Please clarify.

14. Figures 9, 10, 11: orange and pink are difficult to distinguish. I suggest changing one of these colors.

15. Page 26425, line14: why was this time chosen? Is it representative of the entire period? Could the authors instead show an average over a longer period of time?

16. Page 26426, line 23: please add temperature profile to Figure 12

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 26403, 2014.