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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Numerical modelling of microburst with Large-Eddy Simulation" *by* V. Anabor et al.

V. Anabor et al.

u.rizza@isac.cnr.it

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Reviewer #1: We appreciate the helpful and constructive comments you provided on our manuscript. Actually the secondary core was not a good statement. The end result is a much better paper. Thank you!

1) P. 24353, line 20: "forming a secondary core (Fig 3D)". Its not obvious, looking at Fig 3D what is meant by a secondary core. In Fig. 3C near the center there is a strong outflow surrounded by a ring of strong outflow. In Fig. 3D near the center there is a strong outflow and the wind speeds in the surrounding ring have weakened. It is not obvious to the reader looking at Fig 3D, then comparing with Fig. 3C, that a secondary core has formed. What is meant, by the term secondary core needs to be made clearer at this point. - The expression "secondary core" was replaced for "secondary surge in

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the wind field". We meant to evidence the secondary maximum in the wind magnitude also noticed by fig. 6.

2) The following explanation, lines 21-25, of why the so-called secondary core does not produce a secondary vortex ring is an interesting theory, but is there a study that can be referenced, or is this something new that you are postulating? - Modified. "This second surge in the wind field, despite not characterizing a true additional burst, appears to represent a manifestation of a pulsation in the microburst behaviour, which has been detected in radar velocity fields (see Fig. 8 of Hjelmfelt (1988)) and studied in Proctor (1993). Further studies are necessary to better understand the basic dynamics behind such behaviour."

3) P. 24354, line 1: It is bad practice to refer to Fig. 4, before you have described it. - Modified. Thank you.

4) P. 24355, line 1: "primary vortex ring". There is no secondary vortex ring, so why are you calling this the primary vortex ring? - Modified. Thank you.

5) P. 24354: I am not convinced that this argument explains why there are âĹij2 min oscillations. - We decide to modify the manuscript avoiding a mistake in the explanation. It is just a feature observed and is not the main subject in this study. Further experiments are needed to understand this phenomenon. Thank you. "A quasi-periodic ($\sim$2min) oscillation is present close to the microburst center (first 500m) as observed in the time-radial plot of the wind speed."

6) P. 24355, line 16: Close should be closely. - Modified. Thank you.

7) P. 24356, conclusions: the existence of a secondary maximum in wind speeds that trails the first maximum is quite interesting. You say that it is observed, but you should give specific references. Is it mentioned in other numerical modeling studies? On the other hand, if it is something new, then you should present it as a new result of this LES study. Possibly, other numerical modeling studies may have simulated it but

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not commented on it. - Thank you, we modified the text as follow: “ In addition, the simulation suggests the presence of a second surge of strong winds trailing the first outburst which may be a manifestation of a pulsating behaviour of the microburst which has been documented by Hjelmfelt (1988) and studied by Proctor (1993). ”

8) The title should probably say "a microburst" rather than just "microburst". - Modified. Thank you.

Please also note the supplement to this comment:
http://www.atmos-chem-phys-discuss.net/10/C12842/2011/acpd-10-C12842-2011-supplement.pdf

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 24345, 2010.