The study investigates high resolution weather radar Doppler observations to estimate vertical air motion in deep convective clouds. Firstly, an empirical wind retrieval sensitivity analysis is presented. Then, the authors evaluate uncertainties and agreement comparing 3DVAR vertical velocity retrievals by X-, C-, and S-band scanning radars with a co-located radar wind profiler. Finally, the authors investigated differences between 3DVAR and an iterative upwards integration retrieval for the squall line event on 20 May 2011.

The study is scientifically interesting, clearly presented by proper language. In the following some remarks are listed to improve the paper.

1) In the conclusions the authors assert "X-, C-, and S-band scanning radars have been used together to pseudo simultaneously": the reviewer is not able to find information about the S-band radar in Table 2 and its role in the study is not clear.
2) There are no information about radiosonde location, please provide them updating also Figure 1
3) The observation simultaneity is the key factor for multi-Doppler retrievals: please provide more details on this topic.
4) The comparison between 3DVAR and iterative retrievals is performed for only one event. It should extended to all cases.

Thank you for your comments regarding the quality of our manuscript. Below please find our responses to your remarks.

1) We have included the operational parameters of the S-bands in Table 2. We originally left it out because this radar network is somewhat of a legacy network, i.e., it has been in operation for several decades now, and therefore the information was considered redundant. We have also tried to make it more clear in Section 2.2 that both reflectivity and velocity measurements from the S-band radars are used in our retrievals.
2) Figure 1 has been updated to include radiosonde launch sites during MC3E.
3) Pg6 Ln9-13 have been edited to include more information about scan time discrepancies between the radars. We are including a new figure which attempts to show this information qualitatively, e.g., average time offset between CSAPR and KVNX as a function of height.
4) We have extended our comparison between 3DVAR and the iterative upwards integration method to all cases.