

This is my second review of this manuscript. The authors re-run the batch experiments with increased assimilation times, and the experimental design became more reasonable. I appreciate the authors' modifications to the manuscript. I recommend publication with some minor changes and residual explanations, which I have highlighted below.

Scientific and major points

1、 The author's response indicates that the pseudo-vertical velocity observation values used for assimilation are generally small, usually less than 1 m/s, which closely matches the magnitude of the background field. Additionally, the frequency distribution of these observations suggests that numerous pseudo-vertical velocities are assimilated for each analysis time, numbering in the thousands. The case study (Figure 8 of the revised manuscript) demonstrates the positive impact of these observations on precipitation adjustments, could you please provide me with the value of the horizontal wind analysis increments resulting from assimilating such a large number of observations?

2、 The authors emphasize the propensity for generating some false precipitation forecasts when pseudo-vertical velocity observations are assimilated, as evidenced by the outcomes of batch experiments. Is this caused by the use of a large horizontal influence radius?

Line 215: "Forecasts with higher ETS (close to 1) and FSS (close to 1) and lower BIAS (closer to 1), demonstrate better forecast skills." The statement about the BIAS score is not rigorous. A lower BIAS score does not indicate better forecast skills.

Minor points

Line 90: Add "field" after "background".

Line 151: Add "component" after "horizontal wind".

Line 152: From Figure 2, the convergence of u wind is not extending to ground, but 1000 hPa?

Line 174: Change "vertical velocities" to "pseudo- w observations".

Lines 176-179: Add the definition of variables Z and H . In addition, replace the character H with another symbol to distinguish it from the observation operator symbol in the manuscript.

Line 209: Add "observations" after "(VR)".

Line 212: In this section, the assessment for batch experiments is not limited to convective precipitation. It is recommended to delete the word "convective".

Line 235: Change "0600-1200 UTC" to "0600 to 1200 UTC".

Line 281: "while a horizontal wind divergence".

Line 282: Delete “effectively”.

Line 285: Change “using” to “based on”.

Line 288: “assimilation (DA-W) experiments” such a statement may lead to ambiguity. In fact, the control experiment in the article also involves observation assimilation. Here, it would be better to highlight that the DA-W experiment assimilates vertical velocity.