In this round of revision, the manuscript is reviewed by several native English speakers to correct English grammar, and we focused on making sentences flow better. "a", "the", and proper prepositions are modified in many sentences. Only the major sentence changes are listed below with a line number in the revised manuscript.

Line 8: affecting intensity or structure => both the intensity and structure

Line 18: can equally be => can successfully

Line 20: LH profiles from the LUT => LH profiles from a predefined LUT

Line 20: LH from the Next Generation Weather Radar (NEXRAD) => LH used by the HRRR model

Line 31: an effective way to assimilate observation data at this fine resolution has been sought => data assimilation must also be adapted to deal with these finer resolutions

Line 34: convection environment => convective environment

Line 38: LH is not only important to initiate convection, it also contributes to the intensification of convection. => Once the convection is initiated, LH further contributes to the intensification of convection.

Line 45: For this operational purpose => For the operational model

Line 84: with the model cloud field => with both the RAP and HRRR model cloud fields

Line 90: Unlike DPR products that are not available continuously, ABI data in mesoscale sector mode are provided at one-minute resolution, and thus LH can be obtained from GOES-16 as frequently as NEXRAD, making it possible to initiate convection during the forecast. LH from GOES-16 can be beneficial over the regions without radar coverage such as ocean or mountainous regions where beam blockage by terrain degrades the quality of radar data. => In mesoscale sectors of interest, ABI data are provided at one-minute resolution, making the LH product comparable to NEXRAD's product. LH from GOES-16 can be beneficial over the regions without radar coverage such as ocean or mountainous regions where beam blockage degrades the quality of radar data.

Line 94: Detailed descriptions of CSH and SLH products from GPM satellite and how NEXRAD converts reflectivity to LH are provided, followed by the retrieval process using GOES-16 ABI. One case study is provided to compare vertical profiles of LH from GOES-16 with other radar products, and statistical results using three-month of data are provided to evaluate whether total convective heating rates from GOES-16 are comparable to the ones from NEXRAD. Lastly, a Weather Research and Forecasting (WRF) simulation using LH from GOES-16 and NEXRAD is presented to compare impacts of LH from the two datasets in convective initialization. => Detailed descriptions of CSH and SLH products from GPM satellite and how NEXRAD converts reflectivity to LH are provided in Sect. 2, followed by a description of the LH retrieval from GOES-16 ABI in Sect. 3. Section 4 uses a case study to compare vertical profiles of LH from GOES-16 with other radar products, as well as statistical results over a three-month period to evaluate whether total convective heating rates from GOES-16 are comparable to the ones from NEXRAD. Lastly, in Sect. 5, a Weather Research and Forecasting (WRF) simulation using LH from GOES-16 and NEXRAD is presented to compare impacts of LH assimilation from the two datasets in convective initialization. Results are discussed in Sect. 5.

Line 102: LH is not an easily measurable quantity => LH is not easily measured

Line 105: It is achieved using a diagnostic heat budget method => LH can then be calculated using a diagnostic heat budget method

Line 113: The last six terms on the right-hand side that include these microphysical processes are LH from phase changes. => The last six terms on the right-hand side of Eq. (1) represent the processes responsible for LH.

Line 120: then infer the LH from the hydrometeor content. => then inferring LH from the hydrometeors.

Line 122: However, LH products from ground-based radars, or from a microwave sensor on satellites such as DPR on GPM, can be routinely generated over broad scales, the advantages of which outweigh any time and space mismatch. => Nonetheless, because LH products from ground- or space-based radars and radiometers can be routinely generated over broad scales, the advantages outweigh some of the time and space mismatches.

Line 132: briefly explained here => briefly explained here for completeness

Line 135: The initial algorithm by Tao et al.1993 used surface rainfall rate and amount of stratiform rain as inputs to the LUT, but the LUT has been improved by increasing the number of LH profiles, using finer resolution in simulations, and adding new inputs such as echo-top heights and low-level vertical reflectivity gradients => The initial algorithm by Tao et al.1993 used surface rainfall rate and amount of stratiform rain as inputs to a LUT that was generated from a number of representative cloud model simulations. This LUT has since been improved by increasing the number of simulations, using finer resolution in simulations, and adding new variables such as echo-top heights and low-level vertical reflectivity gradients

Line 141: "to select the appropriate LH profile" is added.

Line 144: "the work of" is added.

Line 144: the LUT is created for three different rain types => the LUT is created from cloud resolving model simulations for three different rain types

Line 151: For DPR, a new LUT is created for => The DPR uses a new LUT created for
Line 152: For higher latitude regions, six precipitation types (convective, shallow stratiform, three types of deep stratiform, and other) are used instead of three, and therefore six respective LUTs exist. Inputs to these LUTs are precipitation type, PTH, precipitation bottom height, maximum precipitation, and P_s. => Cloud in higher latitude regions is classified into six precipitation types (convective, shallow stratiform, three types of deep stratiform, and other). This creates six LUTs that provide LH as a function of precipitation type, PTH, precipitation bottom height, maximum precipitation, and P_s.

Line 158: "distributions" is added.

Line 162: comprise => generate

Line 234: Orbital data for these products have finer spatial resolution of 5km => Orbital data for these products is provided at the pixel scale (5km)

Line 235: "from low Earth orbit" is added.

Line 239: in the right places => at the appropriate locations

Line 239: obtained through => constructed using

Line 256: computational instability => computational instabilities

Line 259: moved around to observe interesting => selected around to observe important

Line 270: on available variables => on the variables available

Line 280: several values are tested to produce corresponding convective fractions. => in order to match the convective fraction seen in the GOES-16 convection detection algorithm (described in Lee et al., 2021).

Line 286: measures T_b decrease => focuses on T_b decreases

Line 291: one-month analysis against => one-month of data compared to

Line 300: Using 1.5m/s => Using a 1.5m/s threshold

Line 307: in observation => from observations

Line 311: or => and

Line 313: "any" is added.

Line 322: gathered => included

Line 327: are collected according to 16 bins of the cloud top temperature at 11.2μm. => are sorted into 16 bins based on the cloud top temperature at 11.2μm.

Line 330: It is also nicely shown in the figure that as the T_b decreases => It is also clear in the figure that as the T_bs decreases

Line 356: but in such a case, LH profiles will have to be assigned for each cloud, and the assigned profile will be inconsistent with the observed cloud top temperature for each pixel. => However, LH profiles would have to be assigned for each cloud, and the assigned profile would be inconsistent with the observed cloud top temperature for each pixel.

Line 359: it remains as future study => it remains for future studies

Line 361: whole => full

Line 368: "in this section" is added.

Line 376: to compare how each product determines precipitation type (convective or stratiform) which is one of the major factors in estimating LH profiles => to compare the precipitation types (convective or stratiform) of the three products, as this is one of the major factors in estimating LH profiles

Line 380: the smallest regions compared to others => convective areas relative to the other two methods

Line 437: On the other hand => In contrast

Line 444: Overall values of mean LH profile from NEXRAD in blue are slightly smaller than mean profile of GOES LH or mean convective LH profile from CSH (blue line), but are closer to the total mean profile of CSH (red line), which indicates that the 28dBZ threshold might include some stratiform regions as well. => Overall values of the mean convective LH profiles from NEXRAD in blue are slightly smaller than the mean convective profile of GOES LH and CSH (blue line), but are closer to the total mean profile of CSH (red line), which indicates that the 28dBZ threshold might include some stratiform regions as well.

Line 522: added => summed

Line 523: than GOES-16 detection in Fig. 3b => relative to that of GOES-16 (Fig. 3b)

Line 525: The reason why the total LH is used for a comparison is because NEXRAD LH has such a different vertical structure from GOES LH or CSH LH and such different convective areas, that it is difficult to makes direct comparison between vertical levels. => This comparison is intended to account for differences in the area and convective definitions that make direct comparison between vertical levels difficult.

Line 542: horizontally integrated LH over => horizontally integrated over

Line 558: from the three-month data => during the three-month of the analysis

Line 562: in log-log axes => using log-log space

Line 563: high discrepancy => large discrepancies

Line 581: as HRRR does with NEXRAD => in the same manner as HRRR does with NEXRAD

Line 594: precipitation closer to the observation => precipitation amounts closer to the observations

Line 683: highly depend on => strongly depend on

Line 683: and thus, maximum LH is usually observed at lower level, which is not commonly shown in the modeled heating rate. => This leads the NEXRAD maximum LH to be at lower levels, not often simulated in the models.

Line 693: Applying LH derived from GOES-16 => Applying LH derived from GOES-16 to model initialization

Line 701: additional wind products will be needed for both model and observation to remove errors coming from cloud advection => additional wind products will be needed to remove model and observational errors coming from cloud advection

Line 703: In addition, more investigation will be needed => Further investigation will also be needed