Comment 1:

Section 4.4: The authors must explain why truncation occurs at Dm > 3.5 mm when using the Khairoutdinov and Kogan (2000) autoconversion scheme. Does the KK00 formulation include any truncation for Dm? Or, is this a problem inherent to an assumption in CASIM? As currently written, readers might believe that there is a problem in the KK00 formulation itself.

Author's Response:

We thank the reviewer for pointing this out. We can clarify that the KK00 scheme does not have any truncation added to it. That is as is published. CASIM does not have a raindrop breakup formulation. So to stop the rain DSD becoming too broad and reducing rain number concentration to zero through rain self collection the width of the distribution (through Dm) is limited is commonly done in other microphysics schemes (Jin et al. 2022). This is a future development area. In the current study we are experimenting with the LD scheme which gives a more realistic DSD more independently of such threshold, as explained in the manuscript. Since this statement has created slight confusion as per the comment, we have added a short paragraph to the manuscript.

Jin et al. 2022: https://www.sciencedirect.com/science/article/pii/S0169809522001314

Changes in Manuscript:

In section 4.3 and 4.4 we have added the following text.

"This threshold is a feature of CASIM. Currently raindrop breakup is not treated explicitly that would naturally limit how broad the DSD can become. To capture this behaviour the DSD breadth is limited using a threshold for Dm as is commonly done in other microphysics schemes (Jin et al. 2022). If the DSD breadth was unlimited then rain collecting rain can quickly remove all of the rain number concentration in deep tropical rainshafts."

"However, based on these results of the current sensitivity tests conducted, this approach will need to be revised in the future."

Comment 2:

Figure 8: Histograms for Nw are also needed because DSDs depend on both Nw and Dm.

Author's response:

We agree with the reviewer that DSD depends on both Nw and Dm, and the current version of manuscript included the growth of the drop especially the threshold part were focussed. So we have included the comparison of Nw distribution for KK00 and LD is added to the new version.

Changes in Manuscript:

Histograms of Nw and the following description is added to section 4.4.1 of the Manuscript.

"This is in agreement with the Nw distribution, as towards higher rainrate there is clear narrow distribution of drops while using LD scheme, unlike the broad distribution of drops over Nw range in

KK00. This denotes a more proper segregation of drops of each rainrate intervals over Dm and Nw range while using the LD scheme. Note that the concentration of larger drops is generally low as it is formed by collecting the smaller drops, hence low Nw (figure 8b)."

Comments 3,4,5:

(3) Line 32: "rain droplets" -> "raindrops"
(4) Line 88: "Normalized number concentration parameter" -> "normalized intercept parameter"
(5) Line 91: Tokay et al. (2005, 2003) -> Tokay et al. (2003, 2005).

Response:

We thank the reviewer for these specific errors . We agree with your suggestion and have replaced "normalized number concentration parameter" with the standard term "normalized intercept parameter (Nw)" in Line 88 for clarity and consistency with the literature.

Changes in the Manuscript

line 88, line 32 and line 91 in manuscript are corrected accordingly.

Comment 6:

Figure 1: Please expand the NCUM-R calculation domain and show topographical features.

Author's Response and change in Manuscript

Thanks for the comment and pointing out the importance of a topographical map in the study context. We have included the expanded topographical map with NCUM-R study domain and Tuljapur marked on it.

Comment 7:

Figure 5: The left and right panels appear to be swapped. The text states that there was more convective precipitation on July 30, but Figure 5 shows mostly stratiform precipitation.

Author's Response:

We thank the reviewer for identifying this and we agree that the left and right panels in Figure 5 were inadvertently swapped. We have now corrected the figure so that the panel corresponding to July 30 accurately reflects the increased convective precipitation, in line with the description in the text.

Changes in Manuscript:

Figure 5 has been updated to correctly reflect the intended panel assignments for July 30 and July 18.

Comment 8

Figure 9: The statistical values written within the figure should be listed in a separate table.

Author's response and changes in the manuscript
A table with the statistical values has been added in the paper.

Comment 9:

Figure 9: Do the individual dots in the scatter plot between observation and model_shifted represent data from the model grid points? An explanation is needed in the caption.

Author's response:
Thank you for your comment. We confirm that each dot in the scatter plot represents grid points where both model and observations are available.

Changes in Manuscript
A detailed caption is given for figure 9 as:

'CRA analysis of the convective event on 8th August 2019 in comparison of observation with KK00 scheme set up(a) and LD scheme setup(b)in CASIM. The scatter plot of the observed and model grid points considered for the analysis along with statistical values of the analyzed rainfall are also shown respectively'