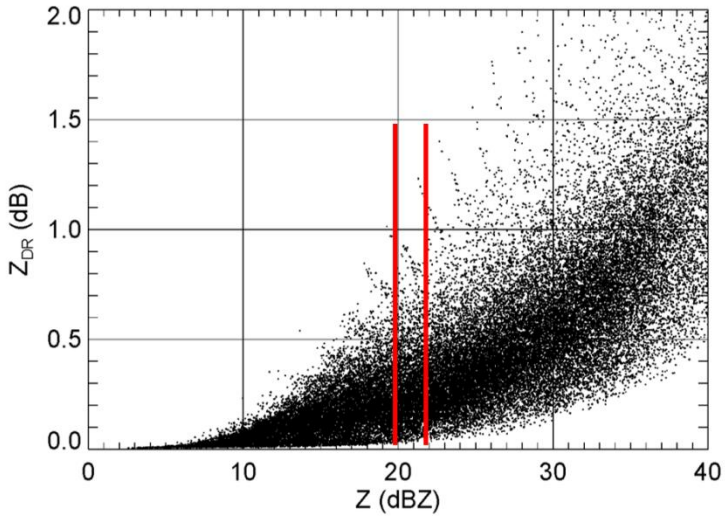
The manuscript “Microphysical Characteristics of Super Typhoon Lekima (2019) and Its Impacts on Polarimetric Radar Remote Sensing of Precipitation” uses a case study of Typhoon Lekima to demonstrate a new technique for attenuation correction on Z and Z_{DR}. The method is interesting, but much more evidence needs to be presented. It is recommended the authors to include more dual polarization observational signatures to validate their hypothesis instead of theoretical calculation derived speculations. In addition, please revise the manuscript for grammar check.

1. Line 18, consider change “expected values” to “intrinsic values”.
2. Line 19, what is Z_H^C means here? What is different between Z_H and Z_H^C? The sentence “As a result … overestimate precipitation” is confusing, please clarify.
3. Line 20-23, do you mean the rain rate R from calibrated Z_{DR} (ideally intrinsic Z_{DR}) and Z relationship outperforms the rest? Then is attenuation also part of the radar measurement that is needed here?
4. Line 27, for flood prediction do you mean Quantitative Precipitation Forecasts (QPF)? QPE has no forecast capabilities. In addition, one of the most important QPE operational platforms is missing here, consider adding this reference:

   Zhang, J., Howard, K., Langston, C., Kaney, B., Qi, Y., Tang, L., Grams, H., Wang, Y., Cocks, S., Martinaitis, S., Arthur, A., Cooper, K., Brogden, J., & Kitzmiller, D. (2016). Multi-Radar Multi-Sensor (MRMS) Quantitative Precipitation Estimation: Initial Operating Capabilities, Bulletin of the American Meteorological Society, 97(4), 621-638. Retrieved Jul 23, 2022, from https://journals.ametsoc.org/view/journals/bams/97/4/bams-d-14-00174.1.xml
5. Line 60, debris blockage (tree leafs, insects, and etc) can also contribute to the surface rain gauge errors.
6. Line 108, please spell out the full names for the two city locations. To emphasis the importance of this area, consider adding the population density as the background for Fig 1b.
7. Line 111, “For this aim” change to either “With this aim” or “On this aim”.
8. Line 112, “WZ-SPOL radar is deployed on a mountain”, what is the elevation of this mountain here, I only see almost flat surface in Fig 1a. Also, what is the VCP used here? Any negative elevation scans? I’m asking this because radar on highland could loss significant coverage at low levels.
9. Line 126-128, is Fig 1b showing all the surface rain gauges or the ones without any interruptions during this event? It is better to show only the rain gauges that will be used in this paper or at least mark the working ones with more highlighted color.
10. Line 129, where is this ratio of 10 comes from? Please add reference if there is any or explain your reasoning.
11. Line 132-133, “which made it the strongest typhoon landing China in 2019 and the third strongest landing typhoon in history of Zhejiang since 1949”, this is repetitive, consider deleting.
12. Line 135, please clarify 100mm precipitation was accumulated during how long of a period.
13. Line 140, change “or” to “and”.
14. Line 187-188. Both theorical analysis and observation prove that the intrinsic Z_{DR} of light rain is between 0.25-0.35dB. Usually, even using light rain as a natural calibrator with intrinsic average

Z_{DR} of 0.25 dB for Z = 20 – 22 dBZ may not be sufficiently accurate, see the figure below, even between 20-22 dBZ, the variability of Z_{DR} is quite large. Since this is a typhoon case, consider using dry aggregated snow technique above the melting layer for calibration purpose, either QVP or RDQVP method will do the trick.

$$< Z_{DR} > = 0.25\ dB, \qquad SD(Z_{DR}) = 0.16\ dB$$



15. Line 203-205, between 0000 UTC, 09 August 2019 and 0000 UTC 11 August 2019 (looks like you are missing a few hours, Fig 4 stops at 1600 UTC 10 August), I don't see maximum hourly wind mostly over 20 m/s. In fact, most stations wind speed is less than 20 m/s, except around 1600 UTC 09 August.
16. Sec 3.1.1. More explanation is needed here. Especially for equation (5). Is R(t) means the maximum rain fall rate per min for each rain gauge or a period of time? How is Ct determined? It seems Ct is a constant throughout this event but different at each locations. And in all, where is this equation comes from?
17. Line 260-270, please provide some supplementary figures like RHIs (Z, Z_{DR}, K_{DP}, and Rhohv preferably) to demonstrate the existence and differences of hail/graupel between WL/YH/DT and XJ/HJ/LH stations.
18. Line 312-314, please provide some supplementary CAPPI figures for the serious underestimation of Z_{DR} with larger Z near the surface. If this is simply because of size sorting near the eyewall, then it is not an issue, but how it should be. See fig 9 in Hu et al., 2020 and fig 3 in Homeyer et al., 2021.

In addition, based on Fig 11, the distance between typhoon's eyewall and half of its strongest precipitation core looks quite far away from the S-band radar here. Please also include the lowest scan 0.5 degree altitude from sea level with increasing distance line plot in the supplementary figures.

Hu, J., Rosenfeld, D., Ryzhkov, A., & Zhang, P. (2020). Synergetic Use of the WSR-88D Radars, GOES-R Satellites, and Lightning Networks to Study Microphysical Characteristics of Hurricanes,

Journal of Applied Meteorology and Climatology, 59(6), 1051-1068. Retrieved Jul 23, 2022, from https://journals.ametsoc.org/view/journals/apme/59/6/JAMC-D-19-0122.1.xml

Homeyer, C. R., Fierro, A. O., Schenkel, B. A., Didlake, A. C., Jr., McFarquhar, G. M., Hu, J., Ryzhkov, A. V., Basara, J. B., Murphy, A. M., & Zawislak, J. (2021). Polarimetric Signatures in Landfalling Tropical Cyclones, Monthly Weather Review, 149(1), 131-154. Retrieved Jul 23, 2022, from https://journals.ametsoc.org/view/journals/mwre/149/1/mwr-d-20-0111.1.xml

19. Line 324-336, please provide some supplementary figures like RHIs and CAPPI here to demonstrate your expected hydrometeors do behave as suggest in the manuscript. One of the advantages of dual polarization is to distinguish between different hydrometeors if needed and very much encouraged.
20. Fig 11. Are the panels showing 0.5 degree or CAPPI at certain altitude? Is Z composite? Please specify this information in the caption.
21. Line 365, Z_{DR} is not sensitive to concentration but sensitive to size.
22. Line 375, I would agree on the big raindrops here since it is usually expected to be warm-rain dominating near the eyewall region. The authors need to provide evidence if hail/grauple do co-exist here, not from derived internal consistence but dual polarimetric signatures/or maybe lightning distribution spatially.
23. Line 384-394, this is the main selling point in this manuscript. In order to demonstrate the "large-sized raindrops tend to break apart during the falling processes but broken droplets resulted in increased concentration of raindrops for higher collision efficiency", please provide RD-QVP time series for all the dual polarization variables. If indeed breakup dominates in the warm rain levels, one should expect a downward negative gradient of Z (6^{th} moment to the size of raindrop) and Z_{DR}.
24. Sec 3.3, I highly recommend the authors to include R(A) using specific attenuation result here for comparison as R(A) can be quite accurate in warm rain dominated precipitation processes. As suggested in the manuscript, R(A)'s advantages include :(i) insensitivity of AH to raindrop size distribution (DSD) variability (Ryzhkov et al., 2014); (ii) KDP is a better indicator of rain rate and liquid water content (LWC, g·m-3) than ZH since KDP is more tightly connected to the precipitation particle size distribution; (iii) R(KDP) and R(AH) inherit the immunity of ΦDP to miscalibration, attenuation, partial beam blockage, and wet radome effects.