Responses to referee 1

p. 1809/1810: I miss a general introduction about the various ways to derive precipitation with radars: e.g. Z-R relation, attenuation bases, via the Doppler spectrum, polarimetric, etc…

As per referee's suggestion, we have added a paragraph on deriving precipitation from different techniques in the introduction section (Line 67 onwards)

p. 1809/1810: Your introduction deals mainly with the MMCR, but the study is about the KAZR.

Now we have revised the paragraph with a main focus on KAZR system (Line 109 onwards). Though we have applied this technique to KAZR systems, the future scope is to extend this analysis to the long-term MMCR observations where precipitation mode data is available. To consider the future scope into perspective, we have retained a brief introduction on MMCRs.

p. 1810, l. 5: "Many phenomena" is to vague

We agree with the referee. We have removed this sentence based on a suggestion from other referee.

p. 1810, l. 12: In section 3.2.2 you say the dynamic range of the KAZR is better than the MMCR. Consequently, how can you apply the product to the MMCR?

Though the MMCR general mode has lower dynamic range, MMCR systems operate in precipitation mode has comparable dynamic range to that of KAZR systems. In *principle, the proposed algorithm can be implemented to long-term MMCR precipitation mode. We have added these details into the revised version (Line 118).*

This sounds like just the acronym was replaced, but its a new instrument, where is the introduction of the KAZR?

We have added an introduction on KAZR systems (Line 106 onwards).

p. 1811: What about describing your main instrument first, then the others? i.e. switch 2.1 and 2.2

As per referee's suggestion, we have switched sections 2.1 and 2.2.

p. 1816, l. 26: So your method works only if there is a co-located S-band? This is an important drawback you have to point out more clearly. Why should I use your method and not the S-Band data directly?

S-band data is used here to identify the relative magnitudes of reflectivity change due to attenuation versus the change in reflectivity from microphysics. This identification is needed especially for rain rates (between 1-4 mm/h), where there is a transitional shift from effects due to evaporation versus attenuation. Out of total profiles (734) considered for retrieving precipitation using attenuation based (A-R) technique, 16 % (118) of the data are eliminated due to microphysical effects, which contributes (< 10 %) to the total rain amount. Hence, the dependence of Ka-band rain retrieval on S-Band radar is only for a short rain rate window,

For example, recent studies have shown that the retrieval of diabatic heating profiles (which requires rain-rate and convective-stratiform fraction) is sensitive to the convective-stratiform rain classification. The way in which the stratiform-convective regimes are defined from scanning (S-Pol) radars are different from the profiling (Ka-band vertically pointing) radars, and there hasn't been any independent consistency *check to examine the representativeness of the S-band retrievals. Ka-band profiling radar, with its high vertical resolution and unique ability to detect bright band (classical signature of stratiform rain) could be used as a consistency check to validate retrievals from other radars.*

Similar to tuning the Z-R parameters from S-band for particular rain fall regime and geography, here also tuning and reference rainfall data is needed in order to apply the present technique to other locations and slightly different systems (KAZR versus MMCR precipitation mode).

p. 1817, l. 1: What percentage of your dataset is affected by this?

The microphysical effects accounts for ~16 % (118) of the total points considered for retrieving rain fall rates based on A-R technique.