

Review: Vertical profiles of snow and rain in Tokyo, Japan, examined by Micro Rain radar (MRR)  
by Koshida et al.

Overall Summary: The paper presents a radar-based examination of the vertical structure of a precipitating band undergoing transition from snow to rain. The paper offers detailed microphysical interpretation of radar reflectivity and Doppler velocity during a snow producing period and a rain producing period. The application and capability of this vertically pointing radar to this problem is of interest and is the most unique aspect of the paper. The paper would be enhanced in this respect by explicitly stating why the radar system employed in this study is unique and what it offers that other systems do not already offer (cw a polarimetric radar).

Our understanding of the microphysics of these systems is probably reinforced rather than enhanced by this paper. Overall I believe the paper is a well based study, just meets the criteria for publications and should be accepted subject to minor changes. I do not wish to see the paper again.

Detailed points:

1. P1 Col 1 Para 3 See comment above, does MRR offer significant advantages over other systems for observing the phase transitions discussed e.g., a scanning polarimetric radar.
2. P1 Col 2 top Why mention DSD retrieval if not relevant to this paper? How is the vertical air motion retrieved or accounted for?
3. P1 Col 2 Para 3 last line-Is this an algorithm or an interpretation?
4. P1 Col 2 para 4 System details could be consolidated in one summary i.e., consolidated last para P1 col 1 etc
5. P1 Col 2 Para 5 L9 kind
6. P1 Col 2 Para 6 What independent characterization of the surface precipitation was available? Do they match with the radar observed precipitation rates, type etc? Would be useful to have this information consolidated into a radar reflectivity time height section. This will show the observed evolution (e.g., bright band) and aid the reader in the author's interpretation. The reader could then assess the context of the periods chosen in terms of the temporal evolution and the convective-stratiform nature of the two periods selected.
7. P2 Para 1. What vertical air motions are typically occurring in these events –see also the convective vents discussed in Fig.4.
8. Fig.1 and Fig.6. What criteria were employed to define the layers?
9. Fig. 2 Is an actual sounding available for validation of the JMA model profiles employed in this study?
10. P2 Col 1 Para 2 Does getting the location of the cyclone correct imply the vertical structure is modeled correctly?
11. Fig.3 Remove noisy data?
12. P2 Col 2 Fig.3 Is the dry layer a result of the sublimation ?

13. P3 Col 1 Para 2. The rain period is defined as convective. Are convective process aiding the inferred microphysical structure e.g. riming
14. Fig.6 Is attenuation an issue at these frequencies and does it impact the observed shape of the reflectivity structure. Is the temporal evolution smearing a bright band?
15. P4 Col 2 Para 1. Why would several MRR's be used given the spatial structure could be inferred from a scanning radar?