



Initial observations of Multi-parameter phased array radar in Tokyo area

Hiroshi Kikuchi *⁽¹⁾, Taku Suezawa ⁽¹⁾, Atsuya Onuki ⁽¹⁾, and Tomoo Ushio ⁽¹⁾

(1). Tokyo Metropolitan University, Hino, Tokyo, Japan, hkikuchi@tmu.ac.jp; suezawa-taku@ed.tmu.ac.jp; onuki-atsuya@ed.tmu.ac.jp; tushio@tmu.ac.jp

In Japan, the five single polarization phased array weather radars (PAWR) are under operation. As a next radar development project, a dual polarimetric phased array weather radar has been developed. It can provide dual polarimetric parameters that reveal detailed microphysics of storms in addition to accurate the precipitation estimation. The radar is termed “Multi-parameter phased array weather radar; MP-PAWR”.

The MP-PAWR, which simultaneously transmits pulses of horizontal and vertical polarized radiation, has been developed and installed in 2017, at Saitama University, Japan. The center of frequency is 9.4GHz (X-band). The MP-PAWR has a scanning scheme similar to the PAWR, which uses the mechanical and electronic scanning in azimuth and elevation angles, respectively. The MP-PAWR provides the polarimetric precipitation measurements in three-dimensional volume scanning in less than 30 or 60 seconds in a range of 60 or 80 km in real-time, respectively.

In this presentation, we will show the initial observation results. To confirm reliability of the measurements and to evaluate the accuracy of the measurements by the MP-PAWR, the initial observation results of the MP-PAWR are compared with an existing X-band polarimetric multi-parameter radar data and a disdrometer data, which is installed at Tokyo Metropolitan University (TMU). The distance between the radar and the disdrometer is 31.2 km.

Figure 1 shows an example of the comparison results between the radar reflectivity factor with the MP-PAWR and the disdrometer. The observation period is from 00:00 to 24:00 in July 28, 2018. The value of the radar reflectivity factor of the MP-PAWR is corrected by the value of the specific differential phase. In comparison with the disdrometer, the mean bias of the MP-PAWR is -2 dB. In this presentation, we will discuss the accuracy of the measurements by the MP-PAWR, quantitatively.

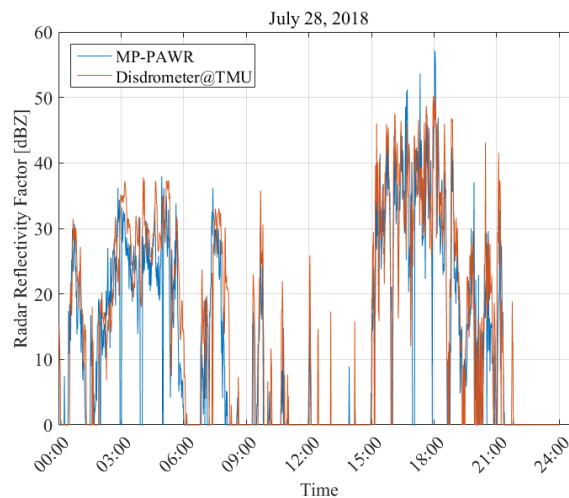


Fig. 1 The comparison of the radar reflectivity factor between the MP-PAWR and the disdrometer