

Data quality control of Ka-band scanning cloud radar at Boseong, Korea

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Cloud radar, transmitting millimeter wave (Ka or W band), has been installed and operated at various sites for cloud research for decades because of several advantages. First, owing to its short wavelength, cloud radar is able to observe fine particles, i.e. cloud droplets. Next, cloud radar can observe with finer spatiotemporal resolution than that of spaceborne remote sensing measurement, and greater coverage than that of aircraft in situ measurements. In addition, cloud radar observation is relatively affordable and easy to maintain. For these reasons, cloud radar is largely used for long-term cloud observation in many sites.

However, due to the high sensitivity of cloud radar, the echo from dust and/or insects are also observed. Thus, proper data quality control (QC) is required to remove such non-hydrometeorological echo. The QC method can be made with the physical constraint of properties observed by the radar, for example, reflectivity, Doppler velocity, and linear depolarization ratio. Ceilometer observation is also effective for the QC since the instrument measures the cloud base height.

Ka-band scanning cloud radar is installed at Boseong Standard Weather Observatory (BSWO) established by National Institute of Meteorological Sciences, in 2013. The radar operation schedule has been changed several times since the installation, thus the QC method must consider various types of operation schedule. In this study, we made novel QC method for the cloud radar which based on the physical constraint of radar observation properties and ceilometer observation. The method is adapted to every type of operation schedule previously performed. The detailed results of the QC and characteristic features of clouds over Korea will be presented and discussed at the conference.