

Portable X-band Doppler weather radar as a new tool for disaster prevention and water resource monitoring

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A portable X-band Doppler weather radar (XDR), which can be carried by a cart and hence can be installed at very small areas such as rooftop area of small building, has been developed. XDR is composed of the outdoor and indoor units. Components of the outdoor unit (a parabolic antenna with a diameter of 1.2 m, magnetron transmitter, and radio frequency (RF) and intermediate frequency (IF) analog components) are housed in a compact body with a weight less than 300 kg. The radar operation, IF digital processing, and data storage are carried out by a desktop computer in which a commercial IF digital receiver is installed. Using the dataset collected from 25 to 26 October 2009 at the Shigaraki MU Observatory (34°51'N, 136°06'E), Japan, equivalent radar reflectivity factor (Z_e) and Doppler velocity (V_d) measured by XDR were assessed using a Micro Rain Radar and a L-band Doppler radar named LQ-7. The assessment results using correlation coefficients and regression lines demonstrate that XDR measured Z_e and V_d accurately.

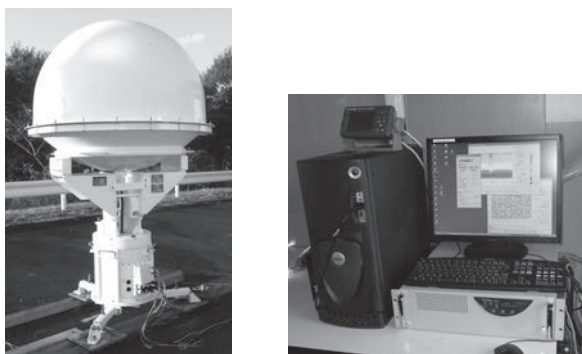


Figure. Outside view of (left) the outdoor and (right) indoor unit of the XDR.

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References

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