

MU Radar Imaging Observation System

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The MU radar has been continuing observations for more than 20 years since 1984. Recently we installed the 'MU Radar Imaging Observation System' to enhance capabilities of the MU radar. The system consists of 'Ultra Multi-Channel Digital Receiving Subsystem' and 'Low-loss Signal Transfer Subsystem'. For the former subsystem we installed 29-channel digital receivers and a digital modulator. With this subsystem we receive signals separately at all 25 antenna groups (each group consists of 19 Yagis). We can also switch transmitting frequencies among at most five selections. They are controlled by a LINUX computer, and data from the digital-receivers are sent to the computer through a local 1000Base-T network. The later subsystem, on the other hand, is to reduce loss of signal transfer of the MU radar. For that purpose we renewed 30% of Yagis (pairs of antenna radiator and coaxial cable) that were found degraded. Final amplifiers and head amplifiers of the 475 transceivers were refreshed, too.

The main purpose of the new system is to enhance resolution of the radar observations by introducing radar imaging technique. With radar interferometry setup in both spatial and frequency domain with more flexibility than the original MU radar, we are able to conduct 3D radar imaging of the atmosphere. We now develop the system software and run test experiments. In the presentation we show the enhancement of the MU radar and preliminary results of 3D imaging observations.