

Development of next-generation microwave radiometer "KUMODES" for multi-band atmospheric observation

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Meteorological forecasts of local and sudden natural disasters, e.g., tornado, heavy snow, and heavy rain under the cumulonimbus, are important subject.

For early prediction and minimization of its damage, there are two subjects; technology to catch rapid changing of thermodynamic field in high rate, high precision, and analysis based on accurate forecasts and now casts.

We have been developing next-generation radiometer, "KUMODES", for the observation of atmospheric field.

Multi-band observation at 20 GHz band for the water vapor, and 60 GHz band for the oxygen molecular allows us to estimate thermal dynamics and cloud mass.

KUMODES is based on technologies developed for radio-astronomy.

Its high sensitivity provides us quick and all-sky observation.

The 20 GHz band receiver employs a cooling receiver to achieve a high sensitivity (low noise) with operating in 10 K.

Cold calibration source is also implemented inside of the cryostat.

Optical pass selection by using mechanical drive allow us to switch the observation and calibration remotely.

In this presentation, we will introduce our prototype system.

We will also present its test observation results in Tsukuba, Japan.

We also discuss about long term forecasts of our attempts based on multi-point observation, e.g., three-dimensional mapping of the water vapor.

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