Simultaneous electrostatic field change measurement of individual lightning discharges at three field sites has made a new contribution to the thunderstorm electricity research. (6) (7) (8) (9)

The thunderstorm expedition illustrated in Figures 1 and 2 will be continued toward the future aiming the study of radiation mechanism of atmospherics from lightning discharges and of thunderstorm cloud physics in connexion with discharge phenomena in the air.

Atmospheric electricity in the upper atmosphere below the E ionosphere is of special interest in relation to the global circuit of atmospheric electricity and to the nature of D region ionosphere which controls the propagation of atmospheric radio waves in VLF and ELF regions. A drop sonde measurement of electric conductivity is going to be made using a rocket-born Gerdien condenser aiming the final goal in future of investigating the ion density distribution in D region. A balloon measurement of atmospheric electricity above the exchange layer is also of our interest to be pursued along with the drop sonde probing.

—Haruji ISHIKAWA—

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Section 3. Radio Astronomy

Sun—Routine observations of the solar radio flux density and polarization are being

conducted at four frequencies, 9400, 3750, 2000 and 1000 Mc/s, together with interferometric observations at 4000 and 9400 Mc/s. The last one, however, has been interrupted since the end of September due to the galactic work to be mentioned later.

Absolute calibration of solar radio flux density was made using three standard horns specially prepared for this purpose (p. 41).

Since the end of 1965, efforts have been concentrated to reconstruct the 9400 Mc/s interferometer. The new compound interferometer will be composed of thirty two 2-meter dishes with two 3-meter dishes, and the resolving power is expected to be 21 seconds of arc. It will be completed in spring, 1966. After the completion of this compound interferometer, the NS elements of sixteen 1.2-meter dishes are to be added to form a T with thirty-two E-W elements.

Similar interferometer at a frequency of 3750 Mc/s is expected to be constructed at Toyokawa within a year, which is the modernization of the former interferometer at 4000 Mc/s constructed in 1953.

A three-element interferometer to locate the sources of decimeter bursts is now under construction. The antennas are 5-meter paraboloids on the equatorial mounts. It is expected to be completed before the end of 1966.

Galaxy—In 1963, a steerable 10-meter dish was built here mainly for the galactic work on centimeter wavelengths. However, as the surface of the dish was unsatisfactory, it was completely taken off. The careful reconstruction was completed in September 1965, and the observation of Cass. A using a maser at 9400 Mc/s showed that the aparture efficiency is very close to 50 % at this frequency. The system noise temperature is about 150°K and the band-width is 6 Mc/s. To start with W49, many galactic radio sources are expected to be observed to determine the frequeacy spectra of these sources.

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Section 4. Whistlers and VLF Emissions

The routine observations of whistlers and VLF emissions are being made at Toyokawa and Moshiri Stations (44°22′N, 142°16′E) according to the scheme shown in Table 1.

Table 1. The observations of whistlers and VLF emissions.

Observation	Frequency in kc/s	Time	Site	Record
VLF emissions (continuous)	1.5—4 4—6 6—8	ever ready continuous ever ready	Moshiri	Pen
VLF emissions (isolated)	0.4—8*	For 2 min. starting at every 20 & 50 min. U. T.	Moshiri & Toyokawa	Magnetic tape
Whistlers	0.4—8*			

* to be extendend to 30 kc/s in July 1966.

Nose whistlers have been observed since spring in 1964 at Moshiri Station where the magnetic latitude is as low as 34°. The intensity of such whistlers is so weak that we had not noticed before. Those whistlers are believed to have penetrated the lower ionosphere at high latitudes and have reached the station after the normal propagation. The success of receiving nose whistlers at a low latitude enconraged us to extend the frequency range up to 30 kc/s. One of the aims of this extension is to estimate the electron density in the magnetosphere at various altitudes at a time from a nose-whistler train which is expected to be observed at a single station. The upward extension of the frequency is expected to be realized very soon as is remarked in Table 1.