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Section 5. Atmospheric Radio Noise and Thunderstorms

During June 1987, we attended in Gumma to the cooperative research project for hail- and gust-storms organized by Prof. Omoto, University of Osaka Prefecture. Following above project, we observed lightning and thunderstorms at Ohtsu, southern coast of the Lake Biwa, during July through August, 1987. The simultaneous muluti-points striking of lightning has become one of the topics in the field of lightning physics. The optical system using a commercial video tape recorder was constructed to study these phenomena and the preliminary observations were carried out with the system. Two muluti-cell thunderclouds were also observed with a radar, a filed change recorder, and a video camera. The cells appeared successively at random with respect to their location and time. Lightning activity did not be corresponded to the activity of individual cell but to development of the thundercloud composed of some number of the cells.

A new idea was presented on the location method of the strike point of ground flash using a radar with a phased array antenna. The wave length of the radar must be 10 cm or longer than it. This new location method is recommended to be used as a complementary method to another conventional one.

The laboratory experiments were made to investigate NO_2 production by electric discharge. A spark discharge generated with an induction coil was used for NO_2 production which was confirmed by the spectral absorption method. Further, the experiments gave us the relationship between the electrical energy dissipated by the spark discharge and NO_2 production rate.

Lightning flashes to high voltage transmission systems were observed from November, 1987 through January, 1988 at Mihama, Fukui as the cooperative research project together with Gifu University, Osaka University, and Kansai Electric Power Company. We observed also during the same period at Ine, Kyoto, located the coast of the Wakasa Bay, the sferics radiated from the lightning flashes occurred around Mihama and propagated over the bay.

Takeuti visited in March, 1987 Institute of Technology Bandung

and Indonesian State Electric Corporation, Jakarta both in Indonesia to discuss about a cooperative research for Indonesian lightning.

Kawasaki reported on the Fourier Spectrum of the field changes due to the positive return strokes during winter thunderstorms in Japan at URSI General Assembly at Tel Aviv, Israel in August 1987.

"The lightning discharge" written by Takeuti in Japanese was published by the University of Nagoya Press.

Prof. Nakai has retired Nagoya University in March, 1987.

-Tosio Takeuti-

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