

Proceedings of the Research Institute of Atmospheric,
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Section 3. Radio Astronomy

This is our last occasion to write the activity report of our group on the Proceedings of the Research Institute of Atmospheric, Nagoya University. The reason for this is that our group is going to be detached from Nagoya University to merge into new National Astronomical Observatory (naming is still provisional), which is scheduled to be established on July 1, 1988. It is an inter-university institute and a merger of three astronomical organizations in Japan, Tokyo Astronomical Observatory, University of Tokyo; International Latitude Observatory at Mizusawa; and our group of Research Institute of Atmospheric, Nagoya University. Although the formal reorganization will take place on July 1 this year, actual transition of our state will continue for a couple of years, during which the facilities at Toyokawa will be maintained to keep the present level of observations. National Astronomical Observatory will have six divisions to cover the whole field of astronomy and eight observatories and centers. The divisions are, where naming is all provisional, Optical and Infrared Astronomy of five laboratories, Solar Physics of two labs, Position Astronomy and Celestial Mechanics of three labs, Theoretical Astronomy of two labs, Radio Astronomy of five labs, and Earth Rotation and Astrometry of five labs. It is understanding of majority of radio astronomy members that the new Nobeyama Radio Observatory is formed jointly from Radio Astronomy Division, Nobeyama Solar Radio Observatory, and Nobeyama Cosmic Radio Observatory.

The first task of the combined solar radio group is to prepare the proposal of the new 17-GHz Radioheliograph project of arcsec spatial resolution and one sec temporal resolution, which is one of the four major instruments to be constructed and hosted by National Astronomical Observatory in the coming decade (Nature 323, 574, 1986). The project is scheduled to be completed in fiscal years 1989 and 1990, so that the first observations are expected to be made concurrently with the SOLAR-A, the Japanese satellite for solar studies in the next solar maximum to be launched in August, 1991 by the Institute of Space and Astronautical Sciences, ISAS. Intense efforts are done to update

design of, and to develop new techniques associated with the 17-GHz Radioheliograph jointly by members of the solar radio group at Toyokawa and at Nobeyama. One of such examples is possible application of a frequency selective surface (FSS) to dual frequency observations in the future at 17 and 35 GHz, development of which has been started by T. Takano with a group of Radio Research Laboratory, Ministry of Post, Telegraph and Telecommunication.

The multi-channel correlator of the backend image processor system to the lambda 8-cm radioheliograph at Toyokawa, or the RSIP, Real-Time Solar Image Processor, has been improved by using Australia Telescope correlator chips, and the new correlator is in operation since July, 1987 (M. Nishio et al., 1988). Its performance is much increased than the previous one in the reduction of electric power consumption, and in smaller size of the volume, which are due to high integration of the AT chips. It has also low noise level in correlation data, which is obtained by fine tuning at correlator input stage. A further improvement is in progress of the RSIP system with respect to the A/D converter unit. The new unit is designed to have capabilities for more precise delay tracking and lower level of DC offset compared with those of the old unit, respectively. Its design has been completed and manufacturing of the unit is in assembly stage. Observations were made with the RSIP during the partial solar eclipse on September 23, 1987. Several tens of snap shot during the eclipse were obtained owing to the high-time resolution performance of the RSIP. Radio maps of the eclipse are in analysis phase, and a few of them are available.

A workshop is organized by K. Shibasaki at Nobeyama Radio Observatory, which featured polar cap brightening at mm waves detected with the 45-m dish at Nobeyama, and correlated structures, where he presented results of model calculations based on VAL model of the solar atmosphere with higher temperature spicules to show polar cap brightening.

S. Enome attended the US-Japan Seminar on Solar Flares: A Forward-Looking Retrospective, held at Honolulu in April, 1987 (S. Enome, 1988). K. Shibasaki attended the Fourth Asian-Pacific IAU Regional Meeting held at Beijing in October, 1987. T. Takano attended the Second Haystack Observatory Meeting on Interstellar Matter held at MIT in June, 1987 (T. Takano, 1988, T. Takano et al., 1988).

Toshiaki Takano joined our group in April, 1987.

March 14, 1988

- Shinzo ENOME -

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