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1. Introduction

Solar research in Japan is conducted at national laboratories (National Astronomical Observatory [NAOJ], Institute of Space and Astronautical Science [ISAS], Communications Research Laboratory [CRL]), universities, and at an inter-university institute (Solar-Terrestrial Environment Laboratory [STELAB] of Nagoya University).

2. Space Programs

The Yohkoh satellite launched in 1991 August is in its 8-th year of operation. Yohkoh is a joint Japan-US-UK mission and so far it has produced more than 400 papers in refereed journals. Synthesized images of flares observed with the hard X-ray telescope (HXT) have recently been published (Sato et al., 1998).

The next solar mission, Solar-B, is again formulated under Japan-US-UK collaboration. The mission will focus on high resolution optical imaging with magnetography, coupled with X-ray imaging and XUV spectroscopy. The 50 cm optical telescope will be built in Japan, while the focal plane package for the optical telescope and an X-ray telescope will be contributed from NASA. An XUV spectrograph is UK's contribution. The Announcement of Opportunity was issued from NASA in 1998 May. The current target for the launch is 2004 summer.

On 1998 January 31, a sounding rocket with a multi-layer mirror telescope was launched from Kagoshima Space Center of ISAS. The mirror of 15 cm diameter has two segments, selectable with a shutter, whose center wavelengths are at ± 2 Å of the Fe XIV 211Å line. Not only the images of 2 MK coronal plasma, but also its Doppler shift exceeding 100 km s^{-1} is measurable. The flight was successful, and 12 frames of images were transmitted to the ground. Additional coating was applied to the mirror which suppresses contamination from He II 304Å line (representing a 8×10^4 K plasma), and pure 2 MK coronal images were obtained. Doppler signals were also found, but the interpretation turned out to be not so straightforward, and a detailed analysis is under way.

3. Ground-Based Facilities

3.1. National Astronomical Observatory

At Mitaka headquarters, a new system based on a 2K×2K CCD camera has successfully replaced sunspot sketches which had been conducted since 1920's. The development of an imaging spectrograph based on a micro-lens array is under way.

At Mt. Norikura, a renovation of the old 10 cm coronagraph (built in 1949) has been completed. 2-D images and Doppler shifts of the corona at 5303 Å are obtained through a birefringent filter. From this year, Norikura Observatory is only operated from spring through autumn, and in winter the observatory is closed.

A. Antalová, H. Balthasar and A. Kučera (eds.): JOSO Annual Report '98, 32 – 33

The Nobeyama Radioheliograph is now operated in dual frequency mode (17/34 GHz). Daily maps of 17 GHz were compiled and published this year (Shibasaki et al., 1998).

3.2. Kyoto University

Hida Observatory of Kyoto University celebrated its 30-th anniversary this year. The polarimeter package was installed at the 60 cm Domeless Solar Telescope of Hida Observatory, and is now being tested.

3.3. Nagoya University

The cosmic-ray group of Nagoya University had deployed five neutron detectors; Mt. Norikura (2770 m), Mauna Kea (Hawaii, 4200 m), Gornergrat (Switzerland, 3500 m), Aragatz(Armenia, 3500 m), and Chakaltaya (Bolivia, 5200 m). The original detector at Mt. Norikura (1 m^2) successfully observed high energy neutrons created at the big flare of 1991 June 4. The new detectors have effective areas of 4–64 m^2.

3.4. Meisei University

E. Hiei's team has been actively conducting eclipse observations in these few years. A universal birefringent filter was delivered from Nanjing Astronomical Instruments Research Center, and will be used to obtain images in Hα and Hβ. An upgrade into a filter magnetograph is also planned.

References

Sato, J., Sawa, M., Masuda, S., Sakao, T., Kosugi, T., and Sekiguchi, H.: 1998, *The Yohkoh HXT Image Catalog: October 1991 - August 1998*, Nobeyama Radio Observatory/NAOJ, Nagano, Japan

Shibasaki, K., and 15 co-authors: 1998, *Atlas of 17 GHz Solar Radio Images from the Nobeyama Radioheliograph*, World Data Center C2 for Solar Radio Emission, Nobeyama Radio Observatory/NAOJ, Nagano, Japan