

POLISH REPORT TO JOSO ON SOLAR RESEARCH IN 1998

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Astronomical Institute of Wrocław University (AI)

1. General

- Staff: Altogether the solar group consists of 14 peoples (3 professors, 5 doctors, 4 masters and 2 technicians).
- Two persons educated in astronomy joined the AI's solar group last year.

2. Instrumental developments

- The AI's solar group constructs now an expeditionary 25-cm heliostat for joint expedition to the 1999 solar eclipse organized in cooperation with Prof. Ken Phillips and his team (Rutherford Appleton Laboratory). During the 1999 solar eclipse the heliostat will feed a horizontal telescope constructed by RAL team for measuring intensity oscillations in the solar corona (Solar Eclipse Coronal Imaging System - SECIS). Construction of the heliostat is supported by a grant of the Polish Committee for Scientific Research.
- As a result of modernization of the computer system and software controlling the observations and operations of the Large Coronagraph and MSDP the time interval necessary to record an individual spectral image (exposure+digitalization+saving) was reduced from 6 s to a little less than 3 s. Thus, the time resolution was improved by a factor of 2.

3. Subject matter of research

Investigations in the following topics were continued:

- small-scale structures in prominences and flares;
- evolution of flares as well as of quiescent and active prominences;
- plasma diagnostic in prominences and flares;
- behaviour of turbulence and energy release in high-temperature flare kernels;
- chromospheric evaporation and Neupert effect in the impulsive phase of flares on the basis of the Yohkoh observations.

4. Studies in cooperation

- internal motions and oscillations in quiescent prominences - in cooperation with the Solar Group of the Institute of Astronomy of the Bulgarian Academy of Sciences under a joint research project "Dynamics of Solar Prominences";
- relation between solar magnetic fields and dynamics of the active region chromospheric fine structures and H α filaments - in cooperation with the Solar Group of the Institute of Astronomy of the Czech Academy of Sciences (Ondrejov Observatory);
- investigation of the structure and evolutionary changes of various structures in active regions (H α filaments, fibrils, prominences, flares, post flare loops) as well as determination of some physical conditions in them on the basis of observations taken by SOHO, Yohkoh, and ground based instruments - in cooperation with l'Observatoire de Paris-Meudon, Mullard Space Science

Laboratory, Goddard Space Flight Center, Rutherford Appleton Laboratory, Debrecen and Konkoly Observatories.

- participation in the joint solar observing campaigns organized by l'Observatoire de Paris-Meudon, I.A.S. Orsay, Goddard Space Flight Center, NOAA Boulder, Rutherford Appleton Laboratory with SOHO, Yohkoh, and TRACE.

Solar Physics Division of Space Research Centre

1. General

- Staff: (17 people, we have now two young research assistants working on Yohkoh, SOHO and TRACE data)
- Our www page is on air (www.cbk.pan.wroc.pl)

2. Running experimental projects

- **Interball - Tail Probe Photometer-Imager RF-15I** The instrument is performing well for more than three years by now. It brings about 1 Mb of data per day which consist of X-ray fluency in several energy bands covering 2 keV - 240 keV range. We have finished the data reformatting program. Data analysis is in progress. The fluencies will become available via our www place shortly.

3. Experimental projects under development

- **RESIK - High Sensitivity Plasma Abundance Experiment**

Expected launch aboard **KORONAS-F** have had to be slipped again till (end) of 1999. This instrument is a common endeavor between American, British, Russian and Polish consortia. It is intended to measure soft X-ray spectra for wavelengths $\lambda < 6 \text{ \AA}$ with the aim to determine precisely elemental abundance in active regions and flare plasma. In construction of the instrument, left over spare BCS Yohkoh detectors constructed at MSSL, UK, will be activated and the new large Bragg monocrystals supplied by NRL, USA, will be used. Integration tests of bread-board electronics have been successful. Flight boards are in the final stage of preparation.

4. Subject matter of research

- **SXT image deconvolution** has been performed for several tens of flares. Our new ideas on organisation of magnetic fields in the corona have received confirmation from SOHO and TRACE observations. Dynamics of sub-arcsec soft X-ray structures can now be followed throughout flare evolution.
- **SOHO - EIT image deconvolution** project have been submitted to appropriate authorities in ESA.

The Astronomical Observatory of Jagiellonian University

No essential changes in staff, instrumentation and research program.

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