

Annual Report to JOSO 2002/2003 - Hungary

A. Ludmány

January 29, 2004

Heliophysical Observatory, H-4010 Debrecen P.O.Box 30., Hungary

Prof Loránt Dezső, founder and former director of the Heliophysical Observatory died on 16th December 2003, in his 90th year. He was the most important personality in the observational solar physics of Hungary in the second half of the twentieth century. We commemorate him in a separate obituary published in the JOSO webpage.

Solar research is made at three sites in Hungary. Observations are only taken in the Heliophysical Observatory, Debrecen, theoretical studies are conducted in the Astronomical Department of the Eötvös University, Budapest, and both theoretical and empirical (but not observational) works are made in the Konkoly Observatory, Budapest.

1 Heliophysical Observatory, Debrecen and Gyula

The highest priority is given to the long-term project called Debrecen Photoheliographic Data (DPD), the most detailed sunspot catalogue. A major development has been achieved in the two years reported: the numerical data tables of six years have been produced. Two of them are incomplete because the final version will also contain the digitized images of active regions with references to the numerical data, but these materials are already suitable for large statistics even in this form because they contain the data of much more than one hundred thousand spots. These studies have been started with promising results. A user-friendly html-presentation has been produced to make easier to survey this large material (<http://fenyi.solarobs.unideb.hu/DPD/index.html>).

The team of the catalogue has a broad international cooperation, sixteen observatories make contributions to the work by kindly providing their observations to achieve a complete coverage. Several investigations have been made to compare different sunspot area data in order to estimate the precision of sunspot area data in the models of solar irradiance variations. In 2002 a very efficient machine has been purchased which digitizes the entire solar disc with the necessary resolution and it makes the procedure easier and faster.

The problem of sunspot penumbra boundary has been analysed. H-alpha observations were continued though not on a regular basis, but during observing campaigns if weather conditions allowed. By using these observations temporal variations during H-alpha flares were studied.

In addition to these works based on proper observations several studies have been devoted to solar-terrestrial problems, in particular to the relations of solar and interplanetary magnetic structure variations in connection with the dipole cycle and with special regard to the geoefficient features. Connections of sea level pressure and ionospheric disturbances were also studied.

The list of Debrecen publications is accessible at
http://fenyi.solarobs.unideb.hu/deb_pub_en_2000.html

2 Konkoly Observatory, Budapest

The Konkoly Observatory has no proper solar observing facilities, the involved scientists conduct solar research in several fields based on an extended international cooperation. Studies based on space instrument data have a fairly broad thematical variety: emerging magnetic fields, active region development, twists and helicity, flares, white light flares, CMEs, coronal heating, all their aspects and mutual relations (<http://www.konkoly.hu/staff/gesztelyi/index.html>). Starspot-sunspot analogues and solar core stability problems have also been considered.

3 Astronomical Department, Eötvös University, Budapest

Solar physicists of the Budapest University are involved in theoretical investigations. They mainly analyzed the turbulent aspects of solar internal processes, like the behaviour and features of the lower overshoot region, the tachocline region and the torsional oscillations. They have close and fruitful contacts with several European institutes in the fields of coronal heating, MHD waves and instabilities, resonant absorption. Details can be seen on the site:
<http://icsip.elte.hu/astro/en/research/solar.html>.