

Instrumentation

A New Station of Prominence Patrol Observations in Slovakia

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Abstract. The data from prominence observations provide an opportunity to study spatio-temporal distribution of prominences over a solar cycle. The Slovak Central Observatory (SCO) at Hurbanovo (South Slovakia) in cooperation with the coronal station at Lomnický štít (Astronomical Institute of the Slovak Academy of Sciences, Tatranská Lomnica, Slovakia) constructed a Lyot coronagraph with parameters D/f of 90/1250/3750 mm in 1996 for regular prominence patrol at Hurbanovo (112 m above sea level).

The aim of this collaboration is a joint annual publication of a catalogue of the observed prominences for each year. This paper also describes the form of the catalogue. The authors would appreciate if other observational stations would join this activity. The editor of the catalogue will be the SCO at Hurbanovo.

1. Introduction

One of the first results of prominence research was the discovery of the polar zone of prominences (Secchi 1872) and its movement toward the poles. Thanks to a large number of observations of prominences and filaments we have an almost perfect image of their distribution around the solar limb and their evolution during a cycle. The observation of prominences is very important for understanding solar activity. It is generally known that solar activity influences the heliosphere, including our Earth.

The regular photographic observations of prominences at the coronal station at Lomnický štít (Astronomical Institute of the Slovak Academy of Sciences, Tatranská Lomnica, Slovakia) have been carried out since May 1967. 29,176 prominences were observed through the end of March 1997. Table 1 gives an overview of the number of days with prominence observation every year. The average number of days with prominence observations per year over the period 1968–1996 is 119 days (the year 1967 was not taken into account because observations started in May).

Table 1. The number of days with prominence observations over the period 1967–1996.

Year	Number of days	Year	Number of days
1967	78	1982	144
1968	113	1983	126
1969	102	1984	125
1970	100	1985	100
1971	113	1986	147
1972	132	1987	134
1973	91	1988	152
1974	78	1989	142
1975	107	1990	147
1976	87	1991	119
1977	104	1992	136
1978	119	1993	125
1979	129	1994	117
1980	117	1995	112
1981	112	1996	121

2. Description of the Catalogue of Solar Prominences and Its Use

The Astronomical Institute of the Slovak Academy of Sciences and the Astronomical Institute of the Bulgarian Academy of Sciences published jointly the catalogue of solar prominences (Rušin et al. 1988, 1994). Later the Astronomical Observatory at Valašské Meziříčí in the Czech Republic joined the regular observations of prominences. Table 2 shows the form of the catalogue.

Table 2. A sample of the catalogue.

1	2	3	4	5	6	7	8	9	10	11
...
29100	97	3	9.25	1919	165	+43 E	3	30	1	60
29101	97	3	9.25	1919	165	+36 E	3	40	2	60
29102	97	3	9.25	1919	165	+18 E	2	40	1	50
29103	97	3	9.25	1919	165	+6 E	3	40	1	50
29104	97	3	9.25	1919	165	-44 E	3	30	2	60
29105	97	3	9.25	1919	345	-18 W	5	40	2	120
29106	97	3	9.25	1919	345	+16 W	4	50	1	130
29107	97	3	9.25	1919	345	+45 W	15	30	3	330
...

The first column gives the number of the prominence (running from the beginning of observation); the second, third and fourth columns give the time of the observation (year, month, day and decimal fraction thereof); the fifth column gives the number of the Carrington rotation; the sixth column contains the Carrington heliographic longitude of the prominence; the seventh column the heliographic latitude of the prominence centre for the given limb (E or W); the eighth column the width of the prominence in degrees (at the solar limb); the prominence height (in arcsec) above the solar limb is given in the ninth column; the tenth column contains the estimated brightness of the prominence on a three-grade scale (the estimation is made during the observation); and the eleventh column gives the prominence area. The unit of area is 1 degree in the

positional angle times 1 arcsec in height (this value can be easily transformed into standard units, e.g. millionths of the solar surface area, using the factor 0.173).

The data on prominence observations are regularly sent to the international centres and published in *Solar Geophysical Data* and *Solnechnye Dannye*.

The data can be used, e.g., for studying the spatio-temporal distribution of prominences over a solar activity cycle according to different criteria. The results of such investigations are presented by Minarovjech et al. (1998, these proceedings).

3. Observation of Prominences at Hurbanovo

The number of days with prominence observations per year could be increased by increasing the number of observation stations. Therefore, M. Rybanský from the Astronomical Institute of the Slovak Academy of Sciences in Tatranská Lomnica proposed to extend the observational network to other astronomical observatories in Slovakia. Within the framework of this project a Lyot coronagraph of parameters D/f of 90/1250/3750 mm was made in 1996 for the prominence patrol at Hurbanovo. The Astronomical Observatory at Hurbanovo is 112 m above sea level. Due to unfavourable weather conditions only test observations have been made so far. An $H\alpha$ filter with a bandpass of 0.5 nm was ordered from the Andover Corporation, Salem, NH, USA. Therefore, no preliminary results or examples of photographic observations can be presented here.

4. Conclusions

The main goal of this project is to obtain as many observations as possible and prepare a joint publication of observed prominences once a year. It is necessary to emphasize that the project is open to all those who want to join this common patrol observations of prominences. A large network of observational stations could lead to an increased number of observational days in one year. On the basis of these observations we could create a better understanding of solar activity from the point of view of the occurrence of prominences. Therefore, the authors would appreciate the participation of other observational stations. SCO will be the editor of the catalogue and will publish it. We intend to collect the data quarterly and make them available on our home page in the future.

References

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