

# 25 Years of SONNE Sunspot Network

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## Abstrakt

In April 1977 the journal SONNE and the SONNE sunspot network were founded in Germany. Now it can look back to 25 years of operation. Observers from all over the world documented 2 1/2 solar cycles by determining the Wolf number. The development of the network and its computational equipment will be shown.

A long tradition of organized amateur solar observing in Germany came to a halt when the DARGESO (German Workgroup for Solar Observing) ceased its operations in 1965. For many years observing activities were coordinated only locally.

In April 1977 some of the West German solar observers met in Berlin, reorganized the VdS Solar Section and founded the journal SONNE. (the VdS is the association of the German amateur astronomers). Also a new nationwide observers network was founded, the SONNE Sunspot Number Network ("SONNE Network"). A uniform template was developed and the Bremen group offered to collect the observations. At the beginning about 40 observers contributed their observations.

Also in 1977 the AKS (Workgroup Sun), which also still exists, was founded in East Germany (GDR) with similar aims.

The observations of the SONNE Network were processed first by the Hamburg group of Rainer Kayser, who got the lists from nearby Bremen. In 1978 the first results

were presented and from now on the quarterly results were regularly published in SONNE.

From 1979 on the data were processed by Klaus Reinsch in Berlin, also the collection of the monthly lists was done in Berlin. The number of observers increased, especially that of the observers outside Germany. So the weather problems were minimized and since 1980 there is no missing day in the observations of the SONNE Network.

In 1982 Erich Karkoschka proposed a new processing algorithm for the data in order to provide more accurate results. The major change was that the standard observer (Hans-Joachim Bruns) should be replaced by a group of standard or reference observers with a stable k-factor. In the same year the SONNE group decided to change to the new algorithm and Klaus Reinsch implemented it. The 'new' method is still in use today.

In 1983 Martin Dillig introduced the Provisional SONNE Sunspot Numbers, which are still published each month, also in the journal "Sterne und Weltraum".

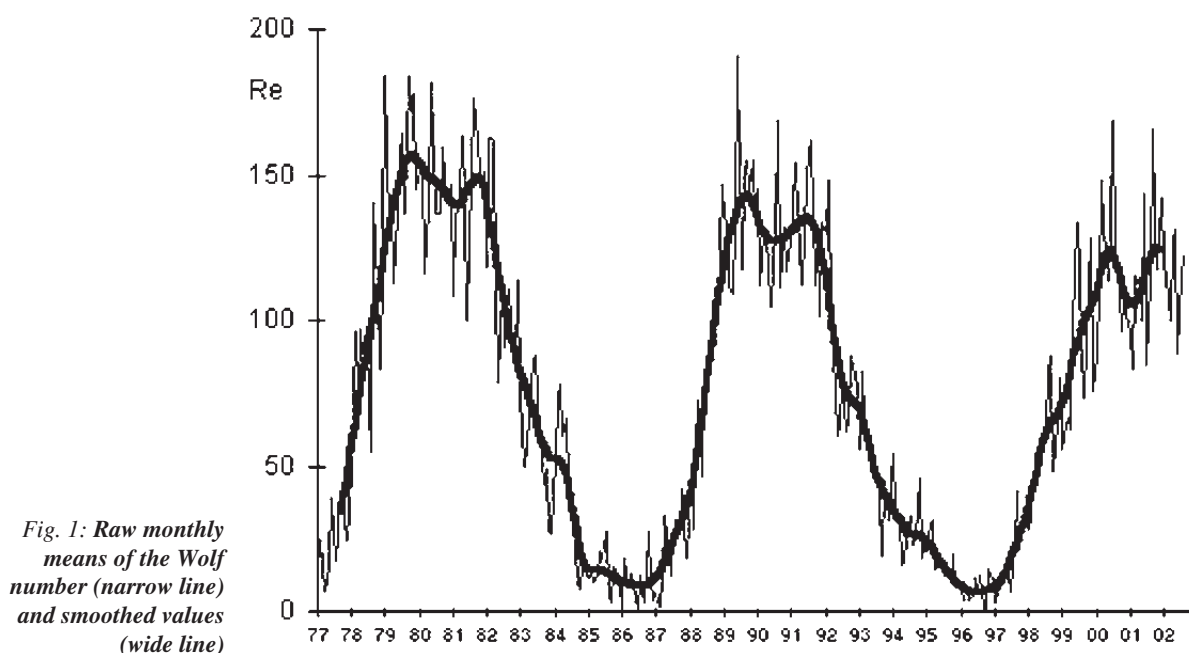


Fig. 1: Raw monthly means of the Wolf number (narrow line) and smoothed values (wide line)

Fig. 3: Monthly means of the Beck numbers (narrow line) and smoothed values (wide line)

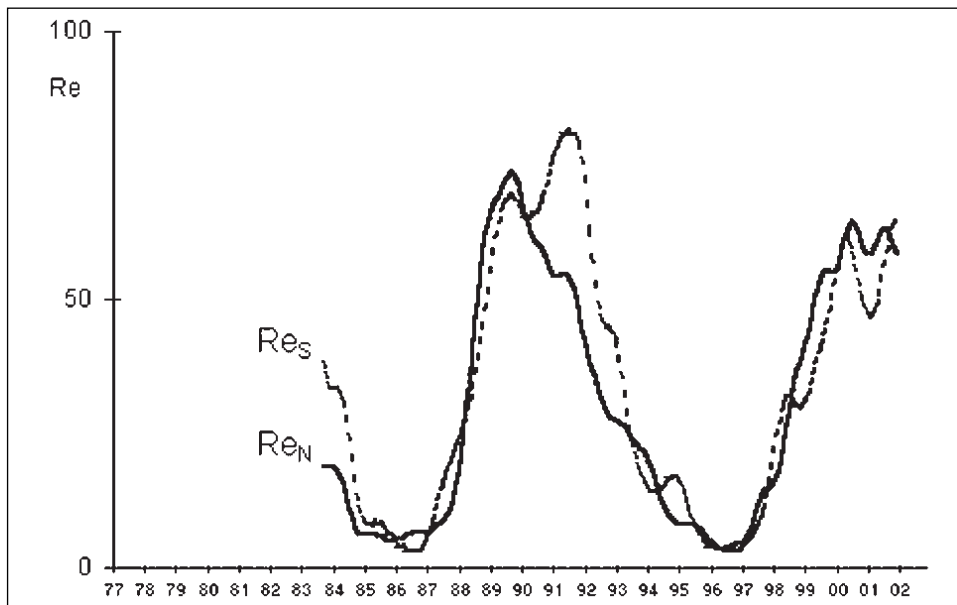
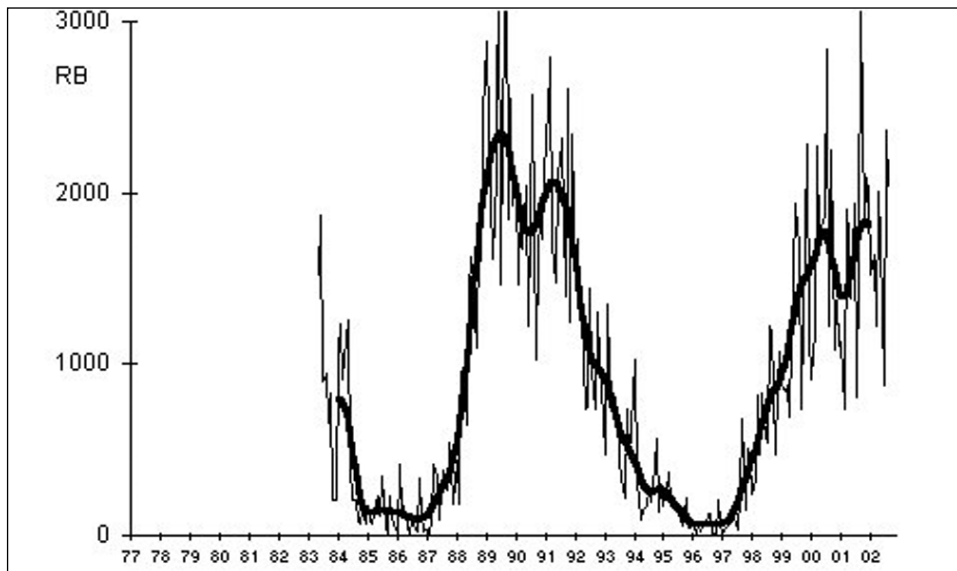


Fig. 3: Monthly means of the Beck numbers (narrow line) and smoothed values (wide line)



In 1992 and 1993 Georg Piehler did the processing of the data, since 1995 the collection of the data is done by Andreas Bulling and the processing and publication by Andreas Zunker.

Also since 1995 the results are also available in the internet (<http://www.vds-sonne.de/gem/res/results.html>).

The SONNE network determines the Wolf number and the Beck number.

Fig. 1 shows the monthly means of the Wolf number determined by the SONNE network. Solar cycles 21, 22 and the rise and maxima of cycle 23 are clearly visible.

The SONNE sunspot network also determines the Wolf number of each solar hemisphere (Fig. 2). Only the smoothed graphs are shown. One can see that there are long periods in which one hemisphere dominates sunspot activity.

The Beck number tries to estimate the total area of all visible sunspots. In order to determine the Beck number

you have to count the spots separately for each Waldmeier Class and multiply it by a factor (which is different for each Waldmeier Class). The total of the results is the Beck number RB. The Beck numbers determined by the SONNE network shows Fig. 3. One can see that the graph looks very much like the one of the Wolf numbers. So the Wolf number is a reasonable and much easier method for tracking solar activity.

Today the SONNE Network is an international network with 120 observers in 20 countries on 4 continents. From Slovakia the 3 observatories Hurbanovo, Michalovce and Rimavska Sobota take part regularly. During the 25 years of operation more than 600 individual observers contributed 318617 observations.

Further workgroups of the VdS-Solar Section are: Pettis Number, A-Netz (Naked Eye Number), Positions, Differential Rotation, Daily Maps, Faculae, Lightbridges, Prominences, Photography/Video, H and Solar Eclipses.