Long-Term Datasets for the Understanding of Solar and Stellar Magnetic Cycles
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Decades of Chinese Solar and Geophysical Data

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Abstract. The Chinese Solar and Geophysical Data (CSGD) was first issued at the Beijing Astronomical Observatory, Chinese Academy of Sciences (now the headquarter of the National Astronomical Observatories, Chinese Academy of Sciences) in 1971, when China's satellite-industry was booming. CSGD covers the observational data (observations of the sunspots, solar flares, solar radio bursts, ionospheric storm and geomagnetic storm) from a couple of domestic observatories and the forecast data. The compiler of CSGD still keeps the data exchange with other institutes worldwide. The type of the dataset includes texts, tables, figures and so on. Up to now, we have electronized all the historic archives, making them easily accessible to people who are interested in them.

Keywords. sunspots, Sun: flares, Sun: radio radiation.

1. Introduction

Long-term observations of the sun are crucial to understand solar activities over cycles. However, previous observations are almost recorded on paper tape or photographic film. For processing the data automatically, some historic archives, sunspots (Mandal & Banerjee 2016) and white-light data (Mandal *et al.* 2017) at the Kodaikanal Observatory, and magnetographs at the Big Bear Solar Observatory (Wang *et al.* 1998) have been digitized. Covering more than 40 years of solar and geophysical data, analogously, CSGD includes a lot of documents written on paper. With the support of the project titled "Recompilation of the historical observation data of China's solar physics", we are fortunate to have electronized all the data of the CSGD. The article will give a detailed interpretation of the poster. Limited to the length of the article, the figures mentioned in the article need to be seen on the poster through the link in Sec. 2.3.

2. History and Dataset

First issued in 1971, CSGD is naturally divided into three historical periods, undergone two major revisions. The revisions include both the substantial adjustments to the content and the amendments to the format. We will give an introduction on the history, and list all the data providers and products in detail.

2.1. *Period I: 1971-1983*

It was the initial stage of CSGD, serving China's satellite industry. The solar physics division of the Beijing Astronomical Observatory (the predecessor of the headquarter of the

National Astronomical Observatories) played the role of the editor of the journal. There are six founders of data providers, Purple Mountain Observatory, Beijing Astronomical Observatory, Beijing Geomagnetic Observatory, Yunnan Astronomical Observatory, Qingdao Astronomical Observatory and Beijing Station for cosmic ray. Some sophisticated observations are collected, like daily sunspot observations (drawing), sunspot groups, daily relative sunspot numbers (see new result from Clette *et al.* (2014)) and sunspot areas, daily charts of sunspot magnetic field (see figure 1), solar radio emission flux, solar radio outstanding occurrences (see figure 2), Hα solar flares (see figure 3), intervals of solar radio emission patrol observation, the geomagnetic activity indices and the record of magnetic storms. At that time, the journal was limited to internal communication. Therefore, it was written in Chinese.

2.2. *Period II: 1984-2001*

After a major revision, the updated version was enlarged into a wealthier database. From 1990's, the newly established organization, Regional Warning Center of China (RWCC) began to take over the editing work (He *et al.* 2008). Four new providers, Beijing Planetarium, Center for Space Science and Applied Research, Shaanxi Observatory and Urumqi Astronomical Station, were added. Meanwhile, new added data products involved the predicted smoothed sunspot number (forecast data), observation of magnetic and velocity fields of solar active regions and sudden ionospheric disturbances (D-region). For exchanging the data domestically and internationally, the journal was written in bilingual, English and Chinese. In the end of each issue, there was always a research note concerning on current observations, some of which were very worth reading even in today's perspective.

2.3. *Period III: Post-2002*

With the advent of the Internet Era, the editorial board would introduce electronic version instead of paper version, making the data easy to store and exchange. Since then, the journal has become an online publication. One can download the journal through the link: http://rwcc.bao.ac.cn:8001/share/csgd/. It is written in English only.

3. Summary

After the careful scanning and re-editing, CSGD has been available to the community of solar physics and geophysics, it meeting the aim to rescue the historic archive in time. We hope there would be new results based on CSGD.

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