

## **Readme: Prominences and Filaments**

### **Prominences and Filaments**

Prominences and filaments are two manifestations of the same phenomenon. Both prominences and filaments are features formed above the chromosphere by cool dense gases held in place by solar magnetic fields. Filaments are observed on the solar disk as dark structures as seen against the hotter chromosphere whereas prominences on the limb appear bright against the perspective of outer space. The scale sizes for prominences and filaments are typically many thousands kilometers. Solar observers typically view prominences and filaments in Hydrogen alpha (656.3 nm). Filaments are sometimes referred to as floccule (plural of flocculus).

Prominences and filaments can rapidly form over a period of a day but then typically persist for several weeks and, in some cases, several months. At breakup the gases within these previously stable structures may be explosively released into space in the form of a coronal mass ejection (CME). Space weather operators have and continue to monitor the location and character of prominences and filaments as potential precursors on near-earth geomagnetic activity.

### **AVAILABLE DATASETS**

#### **Dataset: Prominences (1947 – 1949; 2000 – 2009)**

Description: This dataset consists of a limited number of drawings of solar prominences provided from the solar observatories located at Lomnický and Wendelstein. The [Lomnický Stit Observatory](#) (49° 11' 45" N; 20° 12' 46" E; 2,632 m) is located atop the Lomnický stit mountain in High Tatras mountains of Slovakia near the border of Poland. The Lomnický Stit Observatory is maintained by the Astronomical Institute of the Slovak Academy of Science. The [Wendelstein Observatory](#) (47° 42' N, 12° 00' E; 1,838 m) is situated on the summit of Mount Wendelstein, a prominent mountain located in the Bavarian Alps. It is operated by the University Observatory of the University of Munich. Prominence images (2009-present) available from the [Kanzelhoehe Observatory](#) (46° 40' 40" E; 13° 54' 09" E; 1526 m) are not included in this archive.

- Lomnický data, drawings, 2000-2009
- Wendelstein data, drawings and photographs, 1947-1949 (very few files)

Note: Prominences images from 2009 to present are also available from the

Dataset Status: This dataset is no longer active.

#### **Dataset: Filaments (xxxx – xxxx)**

Description: This dataset consists of listings from observations of solar features. The Carte Synoptiques is a compendium of reduced solar observations on the behavior of filaments which were first provided by Lucien d'Azambuja in 1920 as the "Carte Synoptique de la Chromosphere Solaire et Catalogue des Filaments de la Couche Superieure" covering the time period March 1919 to January 1920. The listings included here for the Carte Synoptiques have been extended through 1989. Other tables and listings included here include Limb-disk features (1957-2011), listings of solar filament disappearances (1964-1980), and the SGD tables. Also included are the Solar Disk and Limb Activity Summaries (DALAS) files (2010-present) from the USAF Solar Observing Optical Network (SOON)

- Carte Synoptiques, listings, 1919-1957
- Carte Synoptiques (Centers), listings, 1957-1989

- Carte Synoptiques (Filaments), listings, 1957-1989
- DALAS – under review
- Limb-Disk Features, listings, 1957-2011
- SGD Tables, listings, xxxx-xxxx
- Solar Filament Disappearances, listings, 1964-1980

Dataset Status: This dataset is still active.

#### References:

- Galsgaard, K. and A.W. Longbottom (1999), Formation of solar prominences by flux convergence, *Astrophysical Journal*, 510, pp 444-459.
- Golub, L and J.M Pasachoff (1997), *The Solar Corona*, Cambridge University Press, IBSN 0-521-48535-5.
- Low, B.C. B. Fong, Y. Fan (2003), The mass of a solar quiescent prominence, *Astrophysical Journal*, 594, 1060-1067.
- Mouradian, Z. and Soru-Escout, I.: 1994, *Astron. Astrophys.* **290**, 279.
- Wright, C. S. and L.F. McNamara (1983), The relationships between disappearing solar filaments, coronal mass ejections, and geomagnetic activity, *Solar Physics*, 87, pp 401-417.