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A long-term geophysical and astronomical dataset: sunspot counting from 1610 to 2021

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Solar activity is an essential factor for the study of many aspects of the geophysical and astronomical sciences. A very simple measure of solar activity is counting sunspots using telescopes. This task can be done even with small telescopes since the Sun is apparently a very large and luminous star. For this reason, it is possible to rescue the ancient observations of sunspots made in the past centuries to obtain an image of the evolution of solar activity during the last four centuries.

The first attempt to reconstruct solar activity from these records was made by Rudolf Wolf, who defined the *Sunspot Number* index in the 19th century. The Zurich Observatory (and later the Brussels Observatory) was in charge of continuing Wolf's work to the present day. In 1998, Hoyt and Schatten presented a new reconstruction of solar activity that was very different from Wolf's reconstruction (Vaquero and Vázquez, 2009). Many of these differences were solved by Clette et al. (2014).

Currently, research to improve the *Sunspot Number* is focused on (i) improving the database by reviewing old observations, and (ii) improving the methodologies to convert raw data into the *Sunspot Number* index. In this work, we try to present the latest advances in this task (Muñoz-Jaramillo and Vaquero, 2019; Arlt and Vaquero, 2020).

References

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