

Observational Data in the first half of 20th century to join modern scientific Observation and historical documents: A Usage example of Photographic Plate of Kwasan Observatory

*Harufumi Tamazawa¹, Reizaburo Kitai⁴, Hiroaki Isobe², Satoru UeNo³, Takahito Sakaue³

1. Disaster Prevention Research Institute Kyoto University, 2. Faculty of Fine Arts, Kyoto City University of Arts, 3. Astronomical Observatory, Graduate School of Science, Kyoto University, 4. Bukkyo University

When surveying records of natural phenomena from historical documents and using them as scientific and academic data, it is important to understand how to compare with modern observation parameters. In order to investigate long-term fluctuations of natural phenomena seamlessly linking research using historical documents with observational data of modern science, it is also important to utilize observation data in early modern observation. In the solar observation, there are solar image data recorded by photographic plates etc from the end of the 19th century to the first half of the 20th century, and archivalization is progressing little by little.

In this report, as an example of utilizing such data, we will look at sunspot images and collation of images of chromosphere, CaK line heliograms by spectroheliography, and geomagnetism observation data in the first half of the 20th century .

Regarding the decades of the 1930s, when comparing photographic plate data of the solar CaK line heliogram photographed at Kwasan Observatory, Kyoto University, and the aa index which is one of the indicators of geomagnetic storms, it was found that geomagnetic storm of a scale exceeding -100 nT even when it occurred, it was recorded that none of sunspots, existed in nine cases. As an example, at the end of April 1933, sunspots were not seen in the Kwasan Observatory's CaK line heliogram and sunspot sketches in various places, but on May 1, a geomagnetic storm was observed in Kakioka, the aa index was about -200 nT. The advantage of the CaK line heliogram is that not only sunspots but also regions where relatively weak magnetic fields such as plague that is not visible with continuous light are distributed are visualized. This makes it possible to obtain information on the global magnetic neutral line where filaments causing coronal mass ejection can exist.

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