The image analysis of sunspot sketches in Dalton minimum(the early 1800s)

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Solar activity changes periodically in 11 years. Because the solar activity is one of the main origins of the variability of the solar-terrestrial environment, it is important to predict the solar activity especially in the category of space weather study. It is known that the polar magnetic field at the solar minimum is closely correlated with the solar activity at the next solar activity. This correlation was confirmed by observing the current sun precisely. On the other hand, it is not clear whether there was a similar correlation in the past sun. Therefore, the aim of this study is to analyze the past sun spot sketch images to verify whether the polar field value at the solar minimum is also good correlation with the next solar activity. Especially, we focused on the Dalton minimum when sun spots were little in the early 1800s. We extracted latitude and longitude of sun spot from sketches in the early 1800 's. We will discuss the differences between the result obtained in this analysis and the characteristics of current sun. As a future plan, we calculate the surface magnetic flux transport model based on these obtained sun spot information and estimate the value of the polar magnetic field at the solar minimum of the Dalton minimum.

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