

## Inclined Zenith Aurora over Kyoto on 17 September 1770: Graphical Evidence of Extreme Magnetic Storm

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Red auroras were observed in Japan during an extreme magnetic storm that occurred on 17 September 1770. We show new evidence that the red aurora extended toward the zenith of Kyoto around midnight. The basic appearance of the historical painting of the red aurora is geometrically reproduced based on the inclination of the local magnetic field and a detailed description in a newly discovered diary. The presence of the inclined zenith aurora over Kyoto suggests that the intensity of the September 1770 magnetic storm is comparable to, or slightly larger than that of the September 1859 Carrington storm. We show some more supportive graphical evidence of extreme magnetic storms.

Reference: Kataoka, R., & Iwahashi, K. (2017). Inclined zenith aurora over Kyoto on 17 September 1770: Graphical evidence of extreme magnetic storm. *Space Weather*, 15, 1314-1320.  
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