

## The earliest space weather monitoring of prolonged aurora activities in Japan and in China

# Ryuho Kataoka[1]; Hiroaki Isobe[2]; Hisashi Hayakawa[3]; Kataoka Ryuho Aurora 4D Project[4]  
[1] NIPR; [2] USSS, Kyoto Univ.; [3] Histories, Kyoto Univ.; [4] -

Great magnetic storms are recorded as aurora sightings in historical documents. The earliest known example of prolonged aurora sightings in Japan was documented on February 21-23, 1204 in Meigetsuki, when a big sunspot was also recorded in China. Before the Meigetsuki event, a significant fraction of a total of two hundreds of possible aurora sightings in Song dynasty (960-1279) of China multiply occurs within a few days and sometimes recurrent approximately with the solar rotation period of 27 days. The prolonged aurora activity events occur only around the solar maximum or in the declining phase as estimated from the  $^{14}\text{C}$  analysis of tree rings, and they do not occur during the Oort Minimum (1010-1050). The historical documents therefore tell us useful information to prepare against the space weather hazards in future.

Reference: Kataoka, R., H. Isobe, H. Hayakawa, H. Tamazawa, A. D. Kawamura, H. Miyahara, K. Iwasaki, K. Yamamoto, M. Takei, T. Terashima, H. Suzuki, Y. Fujiwara, and T. Nakamura (2016), The earliest space weather monitoring of prolonged aurora activities in Japan and in China, submitted to Space Weather.