Solar activity and the climate during the Early Medeival Warm Period

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The Sun holds several long-term cyclic variations such as with ˜88-year and ˜208-year periods in addition to the 11-year sunspot activity cycle and the 22-year cycle in the polarity reversals. The aspect of the long-term variation of solar activity over 10,000 years has been revealed by the measurement of radiocarbon content in tree-rings. The record has shown that the Sun had experienced occasional grand activity maximum as well as several prolonged sunspot minima.

We have investigated the characteristics of the eleven-year and twenty-two-year solar cycles during one of the grand maximum period in 9-10th century (Early Medieval Maximum Period), and have found that the “eleven-year” and the “twenty-two-year” solar cycles had been ˜9 and ˜18 years during the time. The rather short periods of solar cycles during the Early Medieval Maximum Period might be indicating that the Sun had been more active during the time than the recent century. We assume that the comparison of the climate during the Early Medieval Maximum Period and present would be important when discussing the relative importance of solar activity and anthropogenic effect on the global warming.

In this paper, we also discuss what we can learn about the long-term variations of solar activity from the radiocarbon data.