

年輪中炭素 14 濃度の高精度分析による宇宙線の 22 年周期変動および太陽圏環境の復元

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Reconstruction of cosmic-ray 22-year cycles and the heliospheric environment based on carbon-14 in tree rings

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It has been revealed by the measurement of beryllium-10 content in ice core layers that the cosmic ray variation associated with the Hale solar magnetic reversal cycles was amplified during the Maunder minimum in the 17th century. It was suggested that the variability of the heliospheric current sheet was changed during the time. It has been also found that the amplified 22-year cosmic-ray cycles (actual cycle length was 28 years due to the lengthened solar cycles) might have been playing important role in climate multi-decadal variations. Associated with the annual-scale 40 percent increase in cosmic ray flux every 28 years, temperatures and precipitations were changed over the northern hemisphere.

We are conducting high resolution measurement of carbon-14 in tree rings from the Maunder Minimum in order to determine the absolute ages of the events. We report the preliminary results of the measurement.