

AMS radiocarbon dating of Japanese tree rings for regional calibration curve

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Calibration of radiocarbon data can be achieved by comparison of measured radiocarbon age of samples with known calendar age. Tree rings that determined by dendrochronology are one of the important data set for calibration. IntCal13 calibration curve was launched mainly based on trees grown in the northern high latitude. These rings were sampled in ten years each at once to cancel the variation of solar activity, and to obtain sufficient sample size for conventional radiocarbon measurement as well. AMS radiocarbon dating can measure less than 1mg of carbon efficiently and is capable of date annual tree rings. Recent advance in accuracy of AMS radiocarbon measurement reveals that the resolution of IntCal may be insufficient for precise calibration. In particular, regional effect on the calibration curve had turned out to be a major problem. AMS radiocarbon dating of Japanese tree rings with actual age has been carried out to accomplish Japanese regional calibration curve. Tree ring preserves atmospheric ¹⁴C concentration at that time, therefore the offset between radiocarbon age of Japanese tree ring and IntCal should indicate the inhomogeneity in the northern hemisphere.

Keywords: radiocarbon dating, tree ring, calibrated age, atmospheric inventory, regional effect