



Annually resolved atmospheric radiocarbon concentrations for the last 1000 years reconstructed from tree-ring records

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The present radiocarbon (^{14}C) calibration curve (IntCal13) is primarily based on tree ring data measured by decay counting with a temporal resolution of 10 years over the Holocene. Only during the 400-year period from 1550 to 1950 CE a better (i.e. annual) resolution is achieved (Stuiver 1993). Here, we will present a new, annually resolved ^{14}C record covering the last 1000 years. The already existing, annually resolved 400-year record was re-measured with accelerator mass spectrometry (Wacker 2010) and extended by more than 500 years, with the advantage of using 1000 times less material.

The new record clearly shows more fine structure compared to the present calibration curve and will thus allow for a new, high fidelity IntCal calibration curve over the past 1000 yr. The high frequency fine structure in the new atmospheric ^{14}C record also allows comparisons between the absolutely dated tree-ring chronology with floating tree-ring records or with other archives such as polar ice core records by means of combination with cosmogenic ^{10}Be (Sigl 2015, Adolphi and Muscheler 2016). A comparison with published and unpublished polar ^{10}Be record with high temporal resolution will be presented.

Stuiver, M. and Braziunas, T. F. (1993), *Holocene* 3: 289-305

Wacker L. et al. (2010), *Radiocarbon* 52(2): 252-62

Sigl, M. et al. (2015) *Nature* 523: 543

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