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Poster presentation:

Synchronous Holocene Onset Between the North Atlantic and Japan (Suigetsu Updates Following IntCal04)

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The floating tree ring chronology of [Kromer *et al.* \(2004\)](#), together with IntCal04 ([Reimer *et al.* 2004](#)), brought about a significant impact on Lake Suigetsu climate reconstruction studies, by showing that the overall agreement between the Suigetsu and Cariaco Basin ¹⁴C data series (which was the basis of discussions around synchrony and asynchrony of Late Glacial climate changes between the North Atlantic and Japan) had to be lost. Given this, and assuming that the radiocarbon calibration model has become almost free from the marine reservoir effect down to the *ca.* 14,100 cal. BP horizon, we made an attempt at revising the correlation model using $\Delta^{14}\text{C}$ wiggles and Bayesian approaches for wiggle-matching ([Bronk Ramsey 2008](#)). The result showed the Holocene onset in Japan clearly marked by an abrupt rise in temperature at *ca.* 11,550 cal. BP. Within error, this was synchronous to the Holocene onset in the Cariaco Basin greyscale record, but was substantially later than the Holocene onset in the NGRIP $\delta^{18}\text{O}$ curve (*ca.* 11,750 cal. BP). Some minor climatic oscillations at bicentennial timescales during the Bølling/Allerød-equivalent warmer period (SGPI-1) also became synchronous to N. Atlantic minor cooling events. The onset of the Younger Dryas-equivalent cold reversal episode in Japan (SGPS-1) was more gradual than abrupt, unlike in the circum-Atlantic regions. The beginning of the transition phase was also synchronous to that of the Cariaco Basin. However, the completion of the transition was lagging behind Cariaco by *ca.* 250 years. Based on this evidence, we hypothesise that the North Atlantic ocean circulation and solar changes both control climate of circum-Atlantic regions and Japan. However, the relative importance of solar forcing in Japan is higher than in the North Atlantic where the solar factor tends to be overwhelmed by the ocean circulation factor. When these two forcing agents work in opposite directions, the climatic response in Japan becomes more gradual, as is typically the case for the YD onset. When, by contrast, they operate in the same direction, it is reflected as abrupt climate changes in Japan too.

References:

- [Bronk Ramsey C \(2008\)](#) *Quaternary Science Reviews* **27**, 42-60.
Kromer B *et al.* (2004) *Radiocarbon* **46** (3), 1203-1209.
Reimer PJ *et al.* (2004) *Radiocarbon* **46** (3), 1029-1058.