

***Interactive comment on “A reconstruction of radiocarbon production and total solar irradiance from the Holocene  $^{14}\text{C}$  and  $\text{CO}_2$  records: implications of data and model uncertainties” by R. Roth and F. Joos***

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This paper is very well written and the figures are clear and informative. The authors thoroughly take into account everything one could imagine affecting atmospheric  $^{14}\text{C}$  in the Holocene. The use of both the Southern and Northern Hemisphere tree-ring curves to provide the atmospheric  $^{14}\text{C}$  record is a good idea although does not make as much of a difference in the modelled production as I might have expected. Perhaps the authors could comment on this.

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It seems clear that Marmod09 underestimates the production rate considerably compared to this study (Figure 10). Presumably that means the simple ocean-atmosphere box model parameters we use are putting too much  $^{14}\text{C}$  into the ocean. It would be interesting to know how much difference this would make in the surface age of the ocean.

I would point out that the Marmod09 production should not really be considered after AD 1850 or 1900 as this model purposely doesn't include a fossil fuel correction. It is used to provide a reconstruction of the surface age of the ocean for the Holocene for calibration of marine samples from that time period.

I look forward to seeing the final version of the paper.

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