

***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.

Interactive  
Comment

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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