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Interactive comment on "Compiled records of carbon isotopes in atmospheric CO_2 for historical simulations in CMIP6" *by* Heather Graven et al.

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The paper present a compilation of atmospheric Δ14C and δ13C for the period 1850-2015 for use in the Coupled Model Inter-comparison Project 6 (CMIP6) for models simulating carbon isotopes in their ocean or terrestrial biosphere models. The compiled data not only are important for CMIP6 model simulations but can also be used for other modelling studies. The paper is well written and structured and the methods are well described. However, there are several points, which need to be improved. I therefore recommend the paper should be acceptable for publication after addressing the below minor issues.

1. For Southern Hemisphere Δ14C, âĂć The Wellington data from 1955-1983 are

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used for the compilation. Why the Wellington data from 1984-2014 are not used for the compilation given the Wellington-Heidelberg offset is known (on average 4‰ higher for the Wellington data as stated in p.5)? âĂć Please cite references for recent data from Macquarie Island (2007-2009 & 2011), Cape Grim (after 2008) and Neumeyer (after Jan 2008). In Levin et al. (2010), data from Macquarie Island and Neumeyer were reported for the period Dec 1992 – Feb 2004, Apr 1987 – Dec 2008 and Feb 1983 – Jan 2008, respectively.

2. For Northern Hemisphere Δ14C, Izana at $\sim$28oN do not belong to the NH zone (30oN-90oN) defined by the paper. Therefore these data cannot be employed for the compilation of the NH zone. Instead, these data can be used for the Tropics (30oS-30oN).

3. For tropical Δ14C, âĂć Why the data from Mauna Loa & Kumukahi (Hawaii) and Samoa (2001-2007) are not used for the compilation given the lab offset is known for the recent period (within 2-3‰ as stated in p.6)? âĂć A brief description of the model for estimation of tropical Δ14C should be presented, so the readers don't have to read Naegler and Levin (2006) in order to follow the current paper. What are the parameters for air exchange between the 4 atmospheric boxes? Is the atmosphere (4 boxes) a portion of a carbon cycle model?

4. I think the authors should add another Table to give a summary on what atmospheric 14C records during what time are used for the compilation. This will make easier for the readers to follow the paper.

5. p.6, "The version we describe here (version 2) incorporates new and updated Δ14C data from Heidelberg University, . . .". Again, the authors should give references for the more recent Heidelberg data. If they have not been published yet, please mention "unpublished data".

6. p.2, "Records of atmospheric Δ14C and δ13C have been extended into the past using measurements of cellulose from tree rings and of CO2 in air from ice sheets

(ice cores and firn) respectively, . . .". Instead of "cellulose from tree rings" the authors should mention only "tree rings". It is because some IntCal13 and SHCal13 raw data are from tree rings with Acid-Base-Acid treatment and not cellulose or hemicellulose extracted from tree rings.

7. p.8, for atmospheric δ13C, "The revised procedure ensures that all corrections are consistently applied to all samples measured at CSIRO since 1990, including all ice-core, firn air and flask measurements. We do not include measurements conducted at NOAA reported in Rubino et al. (2013)." Please mention why measurements conducted at NOAA reported in Rubino et al. (2013) are not used for the compilation.

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