

Interactive comment on “Does $\delta^{18}\text{O}$ of O_2 record meridional shifts in tropical rainfall?” by Alan M. Seltzer et al.

Anonymous Referee #2

Received and published: 31 July 2017

It has long been suspected that changes in $\text{d}18\text{O}_{\text{atm}}$ and the Dole effect are dominated by changes in the hydrological cycle in low latitudes. With better analyses methods it surfaced that also the long lived $\text{d}18\text{O}_{\text{atm}}$ signal has a millennial scale component. Supported by recent complex modeling efforts (Reutenauer et al., 2015) Seltzer et al., qualitatively explain the observed $\text{d}18\text{O}_{\text{atm}}$ variations with changes of the GPP weighted precipitation signature in the tropics. They provide a thorough and very complete analysis of the individual components of the oxygen cycle. Although the idea of tropical hydrology dominating the $\text{d}18\text{O}_{\text{atm}}$ signal is not new their analysis convincingly demonstrates that shift in the tropical GPP weighted precipitation pattern can explain the observations.

Minor comments: Introduction: Please explain in 2-3 sentences what DO events are.

C1

Page 3, lines 19-20: This statement is wrong. The analysis in Bender et al., 1994 is based on the Vostok CH_4 data available at that time. It simply did not have the resolution to detect millennial variability and neither did the $\text{d}18\text{O}_{\text{atm}}$ record. Please rephrase to make clear that the statement in Bender et al. is of a more general nature. Page 6, line 15: add MODERN mean monthly gridded datasets Page 6, line 24: I do not understand the meaning of this sentence; “. . .GPP refers to an emission, rather than a flux. . .”. My understanding is that equation 4 is a GPP weighted $\text{d}18\text{O}$ precipitation signature and equation 5 is the GPP weighted location of this mean precipitation. Page 9, line 20: “independently” of what? Page 10, line 14: Briefly explain the importance of relative humidity in terrestrial oxygen production. Page 10, line 20: add (East Asian Summer Monsoon) after EASM

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2017-83>, 2017.

C2