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Interactive comment on "Stable isotope paleoclimatology of the earliest Eocene using kimberlite-hosted mummified wood from the Canadian Subarctic" *by* B. A. Hook et al.

Anonymous Referee #1

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The author devoted the oldest tree ring width and dual-isotope (δ18O & δ13C) analysis at annual and subannual resolution from cellulose from mummified wood in early Eocene when the global temperature was high. That is quite interesting for the paleoclimate study in the Subartic and climate forecast in future. Here are some comments on this paper: 1. The author introduced the sample location at present. It is at (64°42'49" N, 110 ° 37'10" W). However, as we known, the earth is composed by seven moving Plates. At the early Eocene, 53.3Ma ago, the geographic location would not be same as present. When the author discus the paleoclimate in Subartic area, it would be more reasonable if the geography transition is considered. 2. In the hot early Eocene, the concentration of greenhouse gas CO2 was believed to be 680–3300 ppmv. Which

role did the high pCO2 play on the relation between atmospheric 13CO2 and that in plant cellulose remains question. The value of Ci/Ca in Eq.(4), ÆŘpc in Eq.(5) are determined in the lower atmospheric pCO2. A discussion on the influence from higher atmospheric pCO2 on the relationship between δ13Catm and δ13Ccellulose, such as the results from FACE experiment maybe helpful to make the calculation more valuable. 3. Generally, δ18O in cellulose from tree rings varies within a little range of 4‰Ḟigure 1 shows a great increase of δ18O in the tree ring from TR42 (?) in subannual resolution, very different from that of former ones, please explain why. 4.The font size in figure 1, figure 2 should be larger. It would be better for the author to add words, such as " a, b ,c ,d" to denote the diagrams in figure 1. Please make clear TR39-42 in figure 1.

Interactive comment on Biogeosciences Discuss., 11, 16269, 2014.