**Climate
of the Past
Discussions**

Interactive
Comment

Interactive comment on "Investigating the past and recent δ^{18}O-accumulation relationship seen in Greenland ice cores" *by* S. L. Buchardt et al.

Anonymous Referee #2

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Overall, the manuscript is a well written examination of d18O data in terms of temperature and accumulation. A few changes would help strengthen some of the conclusions drawn by the manuscript. The manuscript would be improved by including more details about the annual layer counting using the d18O curve method, including errors associated with it. It would also and where available, comparison to other methods of determining annual layers, as for many of the data sets used in this study, those data exist. The equations presented on page 4110 should be presented with goodness-of-fit information. Here the equations are presented as if they are all equally representative of the data set from each region, when in reality, some of the equations do not fit the data as well, and some of the equations are based on limited data (this is addressed in the text, but only in respect to equation 4). Figure 2, page 4118, There are two issues with the data set here that should be better addressed in the text: 1. There is a great

deal of inhomogeneity in the data sets from the different regions, i.e. the SE region data set contains many shorter cores relatively close to one another, while the central region is comprised of fewer, longer cores. Perhaps, as an exercise, it would be useful to examine the same time frame, with similar spacing in between cores for all regions to see if that changes the conclusions? 2. The scatter within individual data sets seems to be a factor of the number of cores comprising the data set as well as an actual difference between cores from high accumulation sites versus low accumulation sites, but these effects are confused because it appears that the high accumulation sites are also sites where more cores comprise the data set. Could one contributing factor to the spread in these data sets be the sampling of spatially variable accumulation patterns? For instance, what if topographical effects on accumulation rates are compounding the conclusions about the closely spaced SE data set? Closely spaced cores might experience the same temperature patterns, but different accumulation rates due to location. Figure 4 ,page 4120, There is too little data to draw any major conclusion about accumulation patterns in recent decades from these plots. The statement in the abstract, page 4106 line 12 and in the conclusions page 4112, line 18 that "none show evidence of increased accumulation" is not quite right. It should say something to the effect of "no conclusive statement can be made about accumulation rate from these data." Technical Comments: Page 4106, line 25, define RCM

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