

Referee : Sentia Goursaud

Summary

This manuscript is a revised version. It presents a new and first established dataset of firn core records drilled in the Ellsworth region. Water stable isotopes, and chemical analyses allowed an annual layer counting method for the dating. Accumulation rates were inferred from the resulting dating, and altogether with the water stable isotope records, meteorological data, and ERA-interim reanalyses and climate modes, were used to extend our current knowledge of the recent climate in this region.

This new version brings substantial improvements compared to the original one, and should definitively be accepted after the authors have considered very minor revisions.

General comments

The introduction incredibly gained in clarity. I can now distinguish the different steps of your argument: (i) the challenges of understanding the recent Antarctic climate change, giving the different climate trends, even within a region (EAIS/WAIS/AP), (ii) the need to get more data, and by extension more proxy data, (iii) the added value of your records in an area located in between the 3 main Antarctic regions, and where no data have been measured yet.

However, it is undoubtedly too long. To shorten it, it might not be necessary to give all the pieces of information about the main factors of variability in the different regions of Antarctica.

But, if it is not shortened, I do not think it is a big deal as all messages are very clear, and it is always better to give too much but clear information.

I do like the fact that you explicitly address the question you tackle in the manuscript. It is usually convenient to introduce the plan by the end of the introduction.

The description of the dating (chap 2.2) is also improved. References of statistical tools used are rigorous.

I thank the authors for the explanations of the nssSO₄/nssNa ratio.

The new Section 4.1 about the signal-to-noise ratios is really valuable, and makes your analysis much more robust. The accumulation rate ones rose my intention. Such low values may result from deposition processes actually. And you argue in that direction citing M. Frezotti's review about the threshold of suspension and blowing snow. This could be the reason you have nearly no dO₁₈/T relationship. But your interpretation is given with caution.

Specific comments

p7 l26 « the highest »

P7 l28 (Chap3.1 « Meteorological data ») Could you give standard deviations associated with means for temperature and wind

p7 l37 Reword « Note that for age-model construction of GUPA-1 two years (1990, 2001) and of BAL-1 three years (1981, 1983 and 1994) ... » so it is more understandable. I suggest : « Note that for the age-model construction of GUPA-1 and BAL-1, two and three years respectively (1990, 2001 for GUPA-1, and 1981, 1983 and 1994 for BAL-1) ... »

p7 l40 replace « lower » by « lowest »

p8 l21 replace « of > » by « higher than »

p8 l22 add a comma after « year »

p8 l23 add a comma after « BAL-1 »

p8 l32 remove « of »

p8 l42 add a dot after « detail »

p9 l12 Replace « we have calculated the signal-to noise ratio of δ 18 O for the UG firm cores to 0.60 for the entire record period (1973-2014), and to 0.78 » by « we obtained δ 18 O signal-to noise ratio of 0.60 for the entire record period (1973-2014), and 0.78 ... »

p9 l16 remove « to »

p9 l35 add a dot after « drift »

p10 l1 « the lowest »

p10 l20 If the relationship is not significant, then there is no need to specify the slope and the p-value. Also you could simplify the reading of the p-value, writing « $p < 0.05$ » when it is significant whereas to give the value, which actually bring no additional information.

P10 l24 remove « of »

p10 l27 add a coma after « region »

p12 l14 add « with » after « corroborating »

p12 l22 after the bracket, add « , the »

Sentences generally might be very long, and coma missing.