

Interactive comment on “Pollen transport to southern Greenland: new evidences of a late spring long distance transport” by D.-D. Rousseau et al.

D.-D. Rousseau et al.

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1) In the first paragraph of the general comments, reviewer2 questions" This poses the question of whether we are to expect a new publication each time there is some tree pollen in the air?". This is unfair to state so. In the paper published in GRL in 2002, we were evidencing for the first time a transport to Greenland. By saying so we effectively were able to characterize the exact timing of the arrival of the pollen grains to Greenland because of the protocol used, a precision that sampling ice layers or using a Tauber trap cannot yet provide. Having so we were able using HYSPLIT to propose how these pollen grains were able to reach southern Greenland as some of the tree are solely North American taxa. Thus the method used was new as the results. In the present paper, we evidence new transports with much more material compared to the previous observation which involve different conditions at the source region, at the

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deposition area, and during the transport itself. So this is not fair to say this is similar or is providing few new data as reviewer 1 assumes. This is definitively not "only some tree pollen in the air".

2) The following sentence is also critical as reviewer 2 is requesting a manuscript dealing with all the sites or a whole series of events. In the case of the on going EPILOBE project, the different stations have not been installed at the same time, depending on the funding process of the project. So to be more precise, Narsarsuaq trap has been installed the second year, and we don't have yet a complete set of observations from the other stations, installed later, to compare with. Moreover, given the kind of data, it would be difficult to have all the data published at the same time as the details of the records must be provided and not hidden in sibylline sentences, or even just trust us.

3) At the end of the first paragraph, reviewer2 acknowledges that "it is not practical to delay publication of interesting events once they occur". Thank you for such comment which is contrary to what reviewer 2 says just few words before, and was not mentioned by reviewer 1. Again this is the second paper evidencing so precisely a long distance transport to Greenland in 3 years.

4) In the second paragraph, reviewer 2 addresses tracing the origin of pollution. This is an interesting topic but very far from our purpose and we certainly do not want to go that far, as by already using HYSPLIT, this seems to be very critical as understood from the comments released by reviewer 1 5) Still in the same paragraph, reviewer 2 questions a link between pollen transport and "how [chemicals and heavy metals] are transported has relevance for pollution studies particularly where final deposition is in the Arctic". Dust particles are also potential vectors of pollutants. This is also interesting to notice that when analyzing the dust origin of particles sampled in recent snow layers in Greenland, Bory et al. (2002) always find Chinese deserts, whatever the season considered. Conversely, Goto-Azuma and Koerner (2001) is showing a different pattern for anthropogenic nitrates and sulfates. Again this is an interesting topic but very far from our purpose, which is to present detailed evidences of long

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distance transport of pollen, to interpret and propose some reliable scenario for such transport, which could be later tested by modelers.

6) In the following sentence reviewer 2 comments on our goal to contribute to paleoclimatology. To study the past, one must know the present, at least to test the models used to reconstruct the past climate dynamics. What we see is that there seems to be a regular phenomenon corresponding to a transport from NE America to S Greenland. No need to aggregate all the yearly trajectories for Narsarsuaq and run some statistics, we have two sets of evidence well constrained in time in two years at nearly the same dates. We provide the dates when such transport occurred in 2003 and recall when it occurred in 2002. This replies to such comments.

7) Still the same paragraph, reviewer 2 indicate that we speak about only one event in the whole year (by the way this replies also to the comment about frequency) and is not rather rare. Considering the quantity of material transported as reported this is nothing, and certainly not for 2003. In a paleoclimatic perspective if you cumulate such quantity over a time interval corresponding to an average high-resolution sample of 50 years, this is no more rare or negligible. Colleagues attending the Arctic workshops where these results were presented are very sensitive to such details as they often find exotic material in their record that they have problems to interpret.

8) In the last sentence reviewer 2 underlines that we are showing different trajectories and so different transport. This is exactly the message that we want to provide and tell that modeling such transport is everything but easy as acknowledged by Helbig et al (2004)

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