

## ***Interactive comment on “Volcanic imprint in the North Atlantic climate variability as recorded by stable water isotopes of Greenland ice cores” by Hera Guðlaugsdóttir et al.***

**Eric Wolff (Editor)**

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Your paper has received two reviews. The discussion will still be open for a couple of weeks and it is possible (though unlikely) that there could be further comments. As you know, you are expected to respond to each of the review comments, and after that I have to give a formal editorial decision. However I think it will be useful if I give you an idea of where we are with your paper now, as it may help you to think about how best to respond to the reviewers.

The reviews, although not going as far as to recommend rejection of your paper, are quite negative, seeing substantial problems with the statistical significance of your re-

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sults, both because of the number of ice cores, the number of eruptions, and the statistical methods used to determine significance. Reviewer 1 also makes an extremely important point about the validity of looking at times after an eruption without considering secondary eruptions and "cleaning" for them.

For the discussion of statistical significance, I add another issue about the presentation of your data. Readers naturally wish to compare the ice core data in eg Fig 1 with the modelled 18O output in Fig 2 (and the same for subsequent figures). However the colour scheme you have selected in Fig 2 and subsequent figures makes this impossible. I have tried using the online version in case it was a problem with the way the figures printed but it makes no difference: it's just impossible to see any significant effect of the eruptions in Fig 2 and most following figures because the contours are almost all the same colour. You need to think hard about how to present this more effectively: a zoom on Greenland might help; using solid shading rather than faint contour lines might help; stretching the colour scale more might help. A further problem exists with Figure 1, because I cannot see what is said to be significant: the very few circles with a red edging (95%) are clear, but I see nothing with an obviously magenta edge (do you mean what looks like black?). But anyway as it stands at present when you say (line 181) "A general agreement can be found" (between Fig 1 and 2), I just can't see it. In fact to be honest, it looks as if its true that there is a general agreement that the eruptions had little statistically significant effect on 18O.

Taking into account the comments of both reviewers and my own misgivings about the presentation of significance, I want to emphasise that a revision that only makes cosmetic changes to the paper will be rejected. In order to convince the reviewers you will need in your response to state how you will very strongly improve the evidence that the data are in support of the modelled findings. This might involve looking at more large eruptions as suggested by rev 1, or by a much improved statistical treatment and presentation. I would like to see what you plan in your response before I would be willing to recommend preparing a new version.

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