

## ***Interactive comment on “Precipitation regime and stable isotopes at Dome Fuji, East Antarctica” by A. Dittmann et al.***

### **Anonymous Referee #2**

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The paper by Dittmann et al. is presenting the precipitation conditions and their influence on the water stable isotopes taking advantage of a 1-year data set of collected precipitation at the inland Antarctic site of Dome F where two deep ice cores have been retrieved in the past. The authors analysed the synoptic situation causing precipitation at Dome F using the AMPS model. The results thus obtained coupled with a back trajectory study allow them to constrain the moisture source regions. The obtained results suggest a more southerly origin for the precipitation than previously reported. Moreover, at least for the considered year, no relationship is found between deuterium excess and moisture source SST and relative humidity.

These two main conclusions point to the importance of long-term monitoring of precipitation in Antarctica in order to achieve a better interpretation of the meteorological factors affecting the variability of snowfall isotopic composition. A better understanding

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of present-day processes will also, hopefully, improve the climate interpretation of the isotopic records obtained from deep ice cores. The paper is interesting, well presented and accurate and I have found the reading very smooth. I recommend its publication after minor revisions listed below.

There is one point that could be questionable if considering or not the end point of the 5 days trajectories as moisture source regions (although the authors at page 13 are claiming that the end point of the 5 days was not automatically assumed as moisture source area). The approach of Sodemann and Stohl (2009) was pointing to a more northern origin for moisture sources and as such how the relationships between deuterium excess and SST/h should be considered?

Page 2, line 5: delete “ice”.

Page 2, line 19: the deuterium excess should be defined here adding also the citation (Dansgaard, 1964).

Page 2, line 20: add also wind speed in parenthesis.

Page 2, 27-28: change into (Noone et al., 1999).

Page 6, line 2: I would change the sentence “Dome F is . . . . in Anatrctica.” into something like “Dome F is one of the places where very old ice can be found”.

Page 6, line 3: may you add the depth of the first ice core drilling?

Page 6, line 5: may you add that the EPICA Dome C is covering the past 800,000 years (Jouzel et al., 2007)?

Page 6, line 8: the sentence that Fujita and Abe were the first to perform direct precipitation measurements is not completely true: there have been also other two cases: one is Ekaykin et al. (2004) presenting 1-year precipitation data from Vostok and then a quite old paper by Aldaz e Deutsch (1967) (Aldaz L. & Deutsch S., 1967. On a relationship between air temperature and oxygen isotope ratio of snow and firn in the

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South Pole region. *Earth Planet. Sci. Lett.*, 3, 267-274).

Page 6, line 14: I am not completely convinced that sublimation processes could be ruled out especially in summer and probably explaining the negative values of deuterium excess.

Page 6, line 28: add a dot after "...2009").

Page 8, line 27-28: please, check here the English.

Page 11, line 17: change from August to November.

Page 13, line 1: add a dot after "... source area".

Page 14, line 28: correct "cantered" into centred.

Page 22, figure 2: the orange dash line is not clear at all. May you improve? In the caption: bottom line: add respectively after percentile.

Page 23, figure 4 caption: correct "read" into red.

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