

Interactive comment on “A comparison of the present and last interglacial periods in six Antarctic ice cores” by V. Masson-Delmotte et al.

Anonymous Referee #3

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General remarks: This manuscript describes the comparison of isotope records from six ice cores in Antarctic and the their moisture origins in the present and the last interglacial periods. The main subject is to realize the differences between isotopes variations in temporally and spatially, moreover, make it clear what did cause the differences. They have attempted to approach this subject using ice core records, the numerical meteorological transport modeling and the analysis of atmospheric circulation in the Antarctic. This is the newest paper for isotopes records of six ice cores in Antarctica and I think this comparison might explain one of scenario of the paleo climate change. I am interested in the section of moisture transport especially, so I have some comments to following;

Specific Comments: Figure 2. I think the description for the calculation of moisture

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origin is difficult to understand, because the technique using the model is explained not enough as Sodemann and Stohl (2009). I read Stohl and James (2004) but I have not understood well yet and this paper does not refer it. An interest point for reader is the air parcel setting because you mentioned the calculation term is differ from early trajectory studies. I think you should add the calculate setting for air parcels in the FLEXPART, e.g., the altitude of start point, the moisture flux is calculated for the total air column or not, and so on.

P2280. L18. Why you can't explain the reason for the difference between the modeled origin and the isotope records? It is very clear that modeled precipitation is not explained well in Antarctica. Some problems for modeling are still remained in precipitation system in Antarctica, such as diamond dust, blocking, and redistribution by Katabatic winds, and so on. You have compared the calculated moisture origin with the results from GCMs, but have you compared the water isotopes or snowfall events from the observation except for ice core data? I think a comparison of modeled moisture origin with the snow isotope data is better than the ice core data.

Reference: Stohl, A., and P. James (2004), A Lagrangian analysis of the atmospheric branch of the global water cycle. Part I: Method description, validation, and demonstration for the August 2002 flooding in central Europe, *J. Hydrometeorol.*, 5, 656–678.

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