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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Trajectory analysis on the origin of air mass and moisture associated with Atmospheric Rivers over the west coast of the United States" *by* J.-M. Ryoo et al.

Anonymous Referee #1

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GENERAL COMMENTS: This paper uses trajectory techniques to investigate moisture transport pathways for precipitation events along the west coast of the USA. While certainly an interesting and important topic, I find this analysis not sufficiently well conceived and conclusive and the paper of rather low technical quality. In my eyes the methodological deficiencies are large and substantial. In addition, the topic does not fit very well with the scope of ACP. Therefore I suggest rejection of the manuscript and encourage the authors to think about a fundamental redesign of their research and resubmission to another journal. A more detailed justification for this judgement is given below.

MAJOR COMMENTS: 1) Technical aspects: The writing of the paper needs substantial improvement. The language is in parts substandard and some passages are unnecessarily complicated and redundant. Repetition of literature in the results section is not needed. Justify your case in the beginning and then discuss the results in the light of the literature in the end. A substantial streamlining of the entire text on the order of 10-20% would be needed before publication in any journal. The figures are of low quality, too. Small labels, distorted maps, messy layout, confusing numbering etc.

2) Method: You claim that your method is good because it does not rely on parametrizations of clouds etc. (P11113 top) in contrast to previous work. First, all the wind fields and diabatic heating rates you use are influenced by parametrizations, so I don't think you can say said. Second, looking at Figs. 4 and 5, the disagreement between your method and analyses is much too large to be useful. This is a serious problem that you appear to ignore. I really don't think we can learn much from this approach the way it is used here.

3) Trajectory length: Then you claim that your approach is new and useful because it uses 14-day trajectories in contrast to some previous studies. In Figs. 2a and 2b, you show that the disagreement between different analysis datasets become very large past seven days. So in my eyes, that means, we should not rely too much on these calculations then. There is a reason why other studies use shorter periods.

4) Conclusions: I think you draw quite general conclusions form only a handful of case studies. Others have used much more extensive statistics to get robust results. Together with the Points 2 and 3, I would argue that your method is not appropriate to generate substantial new knowledge in this area of research.

EDITORIAL COMMENTS: 1)P11110, L26: You need a reference for the increase in drought and extreme flooding. 2)P11112, L6-7: Confusing statement. 3)P11115, L11: You can't expect all readers to know what the apparent heat source is. 4)Avoid using first person so much.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 11109, 2011.