

***Interactive comment on* “Teleconnection between Australian winter temperature and Indian summer monsoon rainfall” by S.-Y. Lee and T.-Y. Koh**

Anonymous Referee #2

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Although the general idea of the manuscript is scientifically reasonable, there are two major concerns which should be addressed before considering the manuscript for possible publications in ACP. The first one is the lack of a modelling work to check the results. To base the conclusions only on correlation analysis is not enough to support for the proposed mechanism. The second one is the lack of a proper methodology to estimate moisture sources. The single use of backward trajectories does not guarantee the proper estimation of sources of moisture. Even more the time scale (about 16-18 days) is clearly too long (the average residence time of moisture in the atmosphere is about ten days, Numaguti, 1999). Please check the methodologies by Stohl and James (2004, 2005) or Sodeman et al. (2008a, 2008b) to diagnose net water changes along a large number of back trajectories that permit to infer the moisture sources for any given region. Results on global sources of moisture for precipitation using these approaches

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(Gimeno et al, 2010 and Gimeno et al, 2011) seem to agree with results from this study (the Indian ocean as one of the main source of moisture for JJA Indian subcontinent precipitation) however the result should be conveniently checked.

Gimeno, L, Drumond, A, Nieto, R, Trigo, RM, & Stohl, A (2010) On the origin of continental precipitation. *Geophysical Research Letters* 37: L13804, doi: 10.1029/2010GL043712. Gimeno, L, Nieto, R, Drumond, A, Durán-Quesada, AM, Stohl, A, Sodemann, H, Trigo, RM (2011) A close look at oceanic sources of continental precipitation. *Eos Transactions American Geophysical Union* 92(23): 193-194, doi:10.1029/2011EO230001 Numaguti, A., 1999: Origin and recycling processes of precipitating water over the Eurasian continent: experiments using an atmospheric general circulation model. *J. Geophys. Res.* 104, 1957–1972. Sodemann, H., C. Schwierz, and H. Wernli, 2008a: Interannual variability of Greenland winter precipitation sources: Lagrangian moisture diagnostic and North Atlantic Oscillation influence, *J. Geophys. Res.*, 113, D03107, doi: 10.1029/2007JD008503 Sodemann, H., V. Masson-Delmotte, C. Schwierz, B. M. Vinther, and H. Wernli, 2008b: Interannual variability of Greenland winter precipitation sources: 2. Effects of North Atlantic Oscillation variability on stable isotopes in precipitation, *J. Geophys. Res.*, 113, D12111, doi: 10.1029/2007JD009416 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. Hydrometeor.*, 5, 656–678. Stohl, A., and P. James, 2005: A Lagrangian Analysis of the Atmospheric Branch of the Global Water Cycle. Part II: Moisture Transports between Earth's Ocean Basins and River Catchments. *J. Hydrometeor.*, 6, 961–984.

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