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Climate of the Past Discussions

Interactive comment on "The influence of the circulation on surface temperature and precipitation patterns over Europe" *by* P. D. Jones and D. H. Lister

J. Jacobeit (Referee)

jacobeit@geo.uni-augsburg.de

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Review of the paper "The influence of the circulation on surface temperature and precipitation patterns over Europe" by P.D. Jones and D.H. Lister

This paper is an important contribution to the issue of circulation-climate relationships, based on a recent daily mean SLP classification and daily European station time series for the 1911-2000 period. It indicates that warming within some of the circulation types is an important factor in context of the general long-term warming across Europe. The focus of this paper is on the entire continent of Europe, therefore it is necessary for defining dominant wet, dry, warm and cold circulation types to use a rather low thresh-

old for the number of stations with significant anomalies in precipitation or temperature (at least half of the stations). In a more regional context stronger thresholds or criteria could be used, but I think looking at the whole European area is also a feasible and intriguing approach. I would suggest only some slight modifications to this interesting paper listed below as two major and some minor comments.

Major comments:

Those readers who are not familiar with the results of Philipp et al. (2007) will have some problems to understand large parts of Fig. 6 results (p. 544), since only 3 circulation types (CT) are reproduced in Figs. 3-5, for the other ones mentioned on p. 544 there is no idea of particular pressure distribution patterns. In contrast to another reviewer who suggested to reproduce further CTs (which can be seen in Philipp et al. 2007), I would suggest to describe shortly those CTs which are mentioned as dominant wet, dry, warm and cold patterns. This would help to understand these characteristics from a dynamical point of view.

According to the abstract the authors consider "whether the long-term warming across Europe is associated with more favourable weather types or related to warming within some of the weather types". The latter aspect is well investigated in the paper, however, the former aspect is not represented correspondingly (apart from some citations of Philipp et al. (2007) on p. 545). I would suggest to refer to Fig. 1 from which some informations can be drawn concerning frequency changes of dominant warm and cold CTs.

Minor comments:

p. 536, l. 20/21: additionally to Yarnal (1993) the authors could mention a recent review paper by Huth et al. (2008): Huth R., C. Beck, A. Philipp, M. Demuzere, Z. Ustrnul, M. Cahynová, J. KyselÃ¡, and O.-E. Tveito (2008): Classifications of atmospheric circulation patterns: recent advances and applications. Annals of the New York Academy of Sciences 1146: 105-152.

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p. 537, l. 11: concerning the issue of frequency-related and within-type-related changes, the authors explicitly cite two papers (Osborn and Jones 2000; van Oldenburgh and van Ulden 2003) – another one dealing with this issue (though with monthly resolution) is mentioned among the references (Beck et al. 2007) but not considered in the text.

p. 537, l. 27: when discussing the influence of large-scale circulation types on regional climate, a station-based index of the NAO is not the best example, large-scale pressure anomaly patterns would be better.

p. 538, l. 1/2: an example that more local pressure gradients increase the explained variance of regional temperature variability has been given by Jacobeit et al. (Climatic Change 48, 2001, p. 233) comparing correlation coefficients of central European temperatures with an index of the NAO and with a central European zonal index (the latter giving higher values than the former).

p. 539, l. 16: the criterion for determining the number of types in Philipp et al. (2007) is not just simply based on explained variance, but on several conditions for a dominant loading (see p. 4075).

p. 539, l. 20: the “basic type” in this clustering context could be addressed more clearly as the centroid pattern.

p. 539, l. 24: what do you mean with “continuous nature of typing” for simplified techniques?

p. 540, l. 25: it would be useful to have exact numbers of series for the different 30-year periods.

p. 545, l. 22-24: for regression models there is also a significant (95% level) increase during spring (see Tab. 5 in Philipp et al. 2007). The slightly negative trend in circulation-related temperature in spring is only true for composite models, but not for regression models (same Table).

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Figs. 3-5: - Why do you select examples for summer, spring and autumn, but not for winter? - Why do you select just these examples and not other ones? - Which level of significance is used in all these figures? - Line 3 of the figure caption: the solid lines are negative (not positive) anomalies, and correspondingly the dotted lines are positive (not negative) anomalies. - The contour lines in the precipitation, temperature and DTR panels depict only little additional information. - In the caption of Fig. 3 the sub-period (1911-1940) has to be mentioned.

Fig. 6: - Obviously this is only one out of 12 panels (4 seasons, 3 variables) mentioned in the text, 11 panels are missing. - Which level of significance is used in all these panels? - The reversed red/blue for precipitation should also be mentioned in the legends for precipitation (not only at the end of the figure caption).

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