

## ***Interactive comment on “Atmospheric teleconnections between the Arctic and the Baltic Sea regions” by Liisi Jakobson et al.***

### **Anonymous Referee #4**

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The manuscript discusses statistical links between several meteorological parameters taken at one point with coordinates 58N; 26E and elsewhere north of 55N mostly using reanalysis data. The authors mostly describe results based on linear correlation analysis but provide little physical interpretations. In particular they show that in winter the teleconnections are largely explained by AO but that in the other seasons the AO/NAO teleconnections play small role. The scope of the study is suitable for Earth System Dynamics; however I also share the concerns expressed by the other reviewers that the study requires major revision before it may become publishable in the journal. In particular I agree with Reviewer 2 that the correlation results should be analysed in order to understand underlying physical processes. Also I would like the authors to be more specific regarding novel findings in the manuscript. Naively I thought that the paper by Thompson and Wallace (2000) (and several other following studies) provides

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sufficient description of the teleconnections by the AO and its impacts on the climatic variables over the whole hemisphere during winter time. The same comment concerns the other seasons. For example the study by Folland et al. (2005) is a good reference regarding the influences of the summer NAO on the climate. Regarding the lagged correlations it would be nice to see how the authors connect their study to those discussing the persistence effect, such as Kolstad et al. (2015). I think the major revision addressing these points is mandatory before the study may be published in Earth System Dynamics.

Also I found the maps in the figures are too small and they are very difficult to analyse. Some of them mostly repeat each other. For example q1000 and t1000 show very similar patterns. I wonder if it is possible to reduce the number of maps.

Technical comment: the paper by Lehmann et al., 2011 is referred to in the text but not listed in the literature section.

References:

Folland CK et al (2009) The summer North Atlantic Oscillation: past, present, and future. *J Clim.* 22:1082–1103

Kolstad EW, Sobolowski SP, Scaife AA. 2015. Intraseasonal Persistence of European Surface Temperatures. *J. Clim.* 28: 5365–5374.

Thompson, D. W. J., and J. M. Wallace, 2000: Annular modes in the extratropical circulation. Part I: Month-to-month variability. *J. Climate*, 13, 1000–1016.

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