

# ***Interactive comment on “Spatio-temporal variability of lightning activity in Europe and the relation to the North Atlantic Oscillation teleconnection pattern” by David Piper and Michael Kunz***

## **Anonymous Referee #1**

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The paper describes nicely the relation between lightning and NOA (North Atlantic Oscillation). Still, the authors may comment and adjust the paper in several aspects: 1. Why is only a 6-month summer period considered? The data is available for full years. Winter months could give interesting connections between, e.g., lightning and temperature of land versus water. 2. The seasonal shift of pressure centers (Azores, Iceland) is not clearly referenced, relating to the variation of lightning in its dependence on seasonal effects. This would help to better distinguish between local and large scale effects on lightning. It concerns also the relevance of local wind-fields in summer time that are more important than NOA. 3. The analysis of the results for lightning–

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NOA correlation appears a bit short. For example, one wants more information about suppression of convection due to NOA+ effects. 4. The climatological question, to what extent 14 years lightning and 30 years NOA fit together may need some more comments. 5. For a long time flash density maps are produced that take into account all flashes in certain grid cells. It may be interesting to learn to what extent the (total) densities correlate with the TD cells. 6. Chapter 3.1 does not present much new insight and could be shortened; too many facts are detailed that are well known. Page 1; Line 16: it is mentioned that large natural hazards occur in southern Germany; the authors may recall that there have been very extensive hail disasters also in northern Germany (2013). Page 8; Line 9: the k scale parameter is mentioned after Eq.1, but now quantities are given and the reader has no good idea what the numbers mean in a meteorological sense. Page 15; Line 23: the authors suggest that cloud lightning could be detected only with VHF methods. This is incorrect. There are systems in the US (several) and in Japan (BOLT), as well as LINET in Europe and elsewhere, which can report sufficient cloud strokes in the VLF/LF range that relate to severe weather, especially hail.

The paper could be published after the indicated suggestions have been duly considered.

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