ANONYMOUS REFEREE #1

This paper considers the relatively new concept of climate networks, which are built by computing mutual correlations (the links, usually after some thresholding process) among climate data (the nodes). The authors have presented such a study based on a large data base. As reckoned by the authors, such a data base have some limitations, one of them being the non-uniform distribution of nodes with respect to geographical distance. In other words, some places (like North America and Europe) have a dense distribution of nodes (stations), whereas this distribution is sparse in South America, for example. In order to overcome this problem the authors have restricted their analysis to North America, where the density of nodes is relatively high. In particular, the authors have found that Eastern and Western parts of North America have distinct network properties, namely degree, accessibility and clustering, thanks to the communities revealed by the climate network structure. The results are interesting, the article is well-written and very clear, and deserves publication.

== Thanks for these comments and for the positive decision on our manuscript.

However, as a final remark, I would like to see (perhaps in a future paper of the authors) attempts to relate these network properties with physically described phenomena. The absence of these discussion does not affect the quality of this paper, though.

== This is an interesting and relevant suggestion for the manuscript indeed. We have included comments motivating further studies with the methodology introduced in the present manuscript.

ANONYMOUS REFEREE #2

General comments: The paper "Correlations between climate network and relief data" applies a number of measures from complex network theory to a spatially distributed temperature dataset form North America. The paper identifies distinct network communities across the region, and highlights a visual correspondence with topographical features. The authors demonstrate effectively how climate networks are able to highlight dynamical features which cannot be detected through more traditional statistical techniques, making this paper a valuable contribution, deserving publication. I agree with the paper's concluding remark that future studies focussed on other climate variables might be useful to further analyse the nature of the relationship between climate and relief. A discussion of the underlying dynamics unveiled by these methods would be a beneficial future step.

== Thanks for these comments. We hope that our manuscript paves the way for further research on extensions of climate network analysis.

Specific comments:

The methods section is very comprehensive, giving details of both the equations and interpretation of network measures. I think this is very appropriate, providing an introduction to network measures for a climate science audience. There is, however, no reference to the method for partitioning communities until the results section (page 831, line 25). Perhaps a brief mention of detecting communities from eigenvalues could be included in the methods section?

== Thanks for pointing this out. We agree that a brief description of the community finding method is welcome. In the methods section we have included the following text:

Since the modularity Q quantifies how good a given partition is, many community detection methods are based on the optimization of this measurement. Different strategies for the modularity optimization have been adopted in the literature such as simulated annealing (Reichardt and Bornholdt, 2006; Guimera et al., 2004), greedy algorithms (Newman, 2004; Clauset et al., 2004) and extremal optimization (Duch and Arenas, 2005). Although these algorithms provide accurate results, most of them have a great computational cost. For this reason, we adopt the method proposed in (Newman, 2006) to obtain the community structure of climate networks. This method consists in mapping the modularity optimization in terms of the spectrum of the so-called *modularity matrix* **B** defined as

$$\mathbf{B} = \mathbf{A} - \frac{\mathbf{k}\mathbf{k}^{\mathbf{T}}}{2m}, \tag{1}$$

where **A** is the adjacency matrix, m is as defined before in eq. 5 and $\mathbf{k} = [k_1, ..., k_N]^T$ the vector whose element k_i is the degree of the i-th node. The spectral optimization of the modularity Q has complexity of order $O(N^2 \log N)$, which turns out to be faster than, for instance, simulated annealing and extremal optimization approaches, besides providing more accurate results for large networks (Newman, 2006; Fortunato, 2010).

Technical corrections:

Page 824, Line 10: “evidences” should, I believe, be “evidence”

== Done

Page 824, Line 25: “weigths” should be “weights’

== Done

Page 827, Line 19: “trough” should be “through’

== Done

Page 830, Line 4: “trough” should be “through’

== Done

== Thanks for carefully reviewing and helping improving our manuscript. We corrected all these minor points.