Climatological Features of the Vento Norte Phenomenon in the Extreme South of Brazil

October 7, 2022

Answer to Reviewer B

General comments

This work studies the phenomenom known as "Vento Norte" by analysing 17 years of weather stations in Southern Brazil. The manuscript brings an interesting overview of this system and, also, some valuable characteristics that could help understanding and improving the prediction of such events. This new version has considerably improved the English writing, and other comments/suggestions were also fully addressed. Therefore, I recommend publication after the authors consider the 4 minor comments that I pointed out below. From my part, there is no need for another round of revision.

We thank the Reviewer for the useful comments and suggestions that improved the interpretation of the obtained results and the clarity of the manuscript. It was really improved the English in this new version of the paper with help of the co-authors. In the following are detailed responses to specific comments.

Specific comments

L8: I do not think "spatial dimension" is the best word to use here, maybe to replicate the title would be a better choice: The climatological features of the Vento Norte..... is studied....
In the new version we have modified the sentence following the reviewer comment.

L13: Drop the word "analyzed".
We have modified the sentence that now reads: *"The downslope windstorm known as Vento Norte (VNOR; Portuguese for "North Wind") is a common phenomenon that occurs in southern Brazil during the winter season. Hence, this study attempted to investigate the climatological characteristics of VNOR using seventeen years (2004—2020) of hourly observations collected at seven meteorological stations distributed over the central region of Rio Grande do Sul*

State. [...]"

L134: This sentence could be improved by a small change, for example: INMET operational automated stations are installed in each city listed in Table 1.
In the new version, we have modified the sentence as: *"[...].). The specifications of the measurement locations INMET operational automated weather stations installed in each city are listed in Table 1. [...]"*

L231: This signal in temperature (south/southwest) does not appear in relative humidity despite these 2 variables are very correlated. Any comment? When I was thinking about that, I missed a brief description, on the methodology section, of the CPF calculation. I strongly recommend that you add this in the manuscript.
In the new version, we have provided the CPF calculation. Also, we prefer not to comment on the behavior of the temperature signal, as this may be too speculative.

"[...]. The CPF can be expressed by the following equation (Iratxe & Carslaw 2014):

$$CPF_{\Delta\theta} = \frac{m_{\delta\theta, C>x}}{n_{\Delta\theta}} \tag{1}$$

where $m_{\Delta\theta}$ is the number of measurements in the wind quadrant θ whose values of a given atmospheric quantity C are greater than or equal to a threshold x (90P), and $n_{\Delta\theta}$ is the total number of measurements from the wind quadrant $\Delta\theta$."