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## ***Interactive comment on “Winter temperatures in the second half of the XVI century in the central area of the Iberian Peninsula” by T. Bullón***

**T. Bullón**

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Referee 3's comments focus on the need to provide more information about the process for obtaining the WCI series, the nature and appropriateness of the statistical processing, and the difficulties readers might have in understanding references written in Spanish. Although I have tried to solve these problems by making the pertinent corrections in the text, I would like to offer some clarification:

1. It is necessary to look at the entire process of collection and reconstruction to determine whether the approach is robust enough to produce WCI values.

A. The initial step in the search for the study's documental evidence was to collect and organize what might have initially been considered banal annotations and re-examine it for information that revealed significant weather information about a spe-

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cific, small geographical site. In this way I was able to cull reliable information from the documents about key meteorological events occurring at the time the manuscripts were written for a particular locality. Although it is true that an isolated reference to weather has virtually no interpretive value, if it is added to many other references and ordered thematically and chronologically, it is possible to obtain reliable meteorological evidence, which is expressed in the WCI values.

B. The study was not intended to produce a separate reconstruction for each source location, rather a single reconstruction for a group of locations, for each cold and mild weather event associated with a specific date. Each event was assigned a maximum score in relation to the degree of importance attributed to it in the documents. Events of a similar type but from a different date in the same winter season were also reconstructed the same way. Then all of the scores were totalled for a final value representing the intensity of the cold or mild weather, for a given year. In the most complex cases, a single value was assigned for the complete winter, based on indirect sources from several localities and documental references.

This collection and interpretation procedure is not often used, but as far as I know, it is the only one that readily adapts to the type of data collected in the study and yields much information. For these reasons, I preferred it others proposed by Pfister (1994), Martin- Vide and Barriendos (1995) y Barriendos (1997).

C. The relationship between the data and the geographical origin of the documental information has the following characteristics: most of the documental sources disappear at the beginning of the seventeenth century and the remaining ones within the instrumental period have features that differ greatly from the sources associated with the timeframe used in this study. Consequently, it was impossible to establish a period in which documental and instrumental data overlapped.

2. The comment on page 702, 121-123 regarding the relationship between the ordinal indices of the instrumental series and WCI, appears important to methodology. I fol-

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lowed a procedure proposed by Bradzil et al (2005), which was later used by Pauling et al (2006), and Rodrigo and Barriendos (2007) in the reconstruction of historic series containing no overlapping periods. As a precaution, I have rechecked the calculations and the results are very similar to the earlier ones. I would also like to add that I now provide uncertainty estimates to calibrate proxy data.

I understand that the comments on pages 703-112 and 703-122-28 about certain aspects of the statistics are meant to help clarify confusing explanations or expand the description of the procedures used, so I have made changes in the original text where necessary. Also, much of the statistical analysis has been eliminated to simplify the variability analysis of the anomalies series.

3. I agree that additional information should be included on the conversion of qualitative data to quantitative data and on the basic contents of the supporting references written in Spanish. Linguistic difficulties seem to be a constant in this paper, so I will do my best to correct the English text.

I included references to my earlier publications to avoid recounting the detailed process of collecting and interpreting data and to present a more succinct analysis and fewer references to specific details. Perhaps the methodology used to interpret the data is not convincing, but I am certain that if the data were processed another way, the results would be the same. The information is what it is, and the conclusions derived from it must be consistent with it. Although some information may have been overlooked or lost, that which does appear is what my resources had to offer.

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Interactive comment on Clim. Past Discuss., 4, 697, 2008.

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