

## ***Interactive comment on “Interannual variability of winter precipitation in the European Alps: relations with the North Atlantic Oscillation” by E. Bartolini et al.***

**E. Bartolini et al.**

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We greatly appreciate the extensive and insightful comments from the referee. The relevant comments have been addressed and the manuscript text has been revised/corrected accordingly.

- Line 13 page 2047. You cite some previous works on the same subject. Please specify which kind of relationship do they find. You only comment on the fact that they identify trends, while you don't (lines 10-20 page 2053). Say, if so, that they find also significant correlation between winter precipitation and NAO.

In the revised paper we provide a more exhaustive description of the results from pre-

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vious work.

- Lines 18 and following, page 2047; lines 19 and following, page 2049. It is difficult, for a non-expert, to realize what effectively are the "modes of atmospheric circulation", without turning to references. You could add some more explanations or, better, you could add a figure where data you are comparing are shown (e.g. winter rainfall amount or SPI in one grid-cell/station vs NAO).

In the revised paper we added a brief explication. With regard to the figure suggested by the referee, we realized the importance of showing the time series of the data we are using. Instead of a scatterplot of precipitation versus climate indices, we added a time series plot with all the indices considered and total winter precipitation anomaly calculated over the alpine region.

- line 4, page 2049. Specify, if it is the case, that these stations were not used for the creation of the CRU TS 1.2 grids.

Unfortunately we do not have a list of the station records used for the preparation of the database CRU TS 1.2.

- line 19, page 2050. The definition of SPI, and how it is calculated, is confusing. You say that the SPI "represents the difference between precipitation values and the mean, divided by the standard deviation for a given averaging period  $t$ ", but apparently it is not calculated as "difference between precipitation values and the mean, divided by the standard deviation for a given averaging period  $t$ ".

The referee is correct about the confusing definition we provided for SPI. In the revision we clarified the explanation.

- line 7, page 2054. I would say that strong year-to-year variability in winter-season precipitation can "definitely not" be explained by the dominant large-scale modes of climate variability in the Northern Hemisphere.

amended

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- line 24, page 2054 - I would not say that the dependence of precipitation regimes on NAO in the Alps region is "particularly" weak. It is weak as in all the band correspondent to their latitude, that is apparently the transition band between positive and negative correlation (Fig. 3 and 4).

amended

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 2045, 2008.

**HESD**

5, S1866–S1868, 2008

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