A. Speranza (Referee #1)
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In this paper, the concurrence of atmospheric rivers and explosive cyclogenesis over the North Atlantic and North Pacific Basins is analysed using ERA-Interim reanalysis data for 1979-2011 (for the extended winter months ONDJFM). Atmospheric rivers are identified in concurrence with almost 80% of explosive deepening cyclones and only in about 40% of the cases of non-explosive cyclones. The Conclusion is offered that "The above results strongly indicate that the presence of an AR near the developing cyclone is related with a higher probability of an explosive cyclogenesis occurrence. A detailed analysis of the time evolution of the high values of water vapour flux associated with the AR during the cyclone development phase leads us to hypothesize that this fact is a fingerprint of a physical mechanism that raises the odds of an explosive cyclogenesis occurrence and not merely a statistical relationship. . . .. This insight can be potentially helpful to enhance the predictability of high impact weather associated with explosive cyclones and atmospheric rivers."
Dear Antonio Speranza, thank you for your valued time dedicated to reviewing this paper. We believe that these modifications will improve the manuscript. Here you can find the response to your comments, questions, and suggestions.

There are some minor errors like, for example:
Pag.6 line 7 "Whereas for the Atlantic storm track has a clear SW-NE orientation is found, reaching values of 0.8 events"; either "has" or "is found" should be omitted;
The text was corrected accordingly.

Pag.4 line 8 "*. . .*statistics changes over time (Table S1), as not all systems have the same life time."; "Table" is probably "Figure"; but overall the text is adequately written.
In this specific case we are actually refereeing to the Supplementary Table S1. In Table S1, we show the number of explosive cyclones (EC) and non-explosive cyclones (NEC) in each time step used for the computation of Figures 3 to 5 and Supplementary Figures S1, S3 and to S4 for the North Atlantic domain (a) and for the North Pacific domain (b). We agree that the original text was not clear regarding the differences between Supplementary table and figure. Therefore, we have changed the text in the new version of the manuscript in order to highlight when we are referencing a Supplementary Table and when to the Figure.

The object of the study is interesting and I believe the analysis can be extended to the role of localized flows of atmospheric water also in other types of adverse weather development. For example, in the analysis of the event which led to the disaster in Giampilieri (October 2009) a concentrated southerly flow of atmospheric water channeled between Sicily and Calabria was the source of intense precipitation which eventually caused the deadly landslide.
We agree with the reviewer that localized flows of atmospheric water (called Atmospheric Rivers) can lead to huge socio-economic impacts in different regions of the Globe. In fact, the authors contributed to several recent studies analysing extreme precipitation and floods associated with ARs in the Iberian Peninsula

(Ramos et al., 2015; Eiras-Barca et al., 2016, Pereira et al., 2016, Liberato et al. 2013, Trigo et al., 2014). In addition, other studies (as mentioned in the introduction) show the importance of the Atmospheric Rivers in extreme precipitation not only in the west coast of the USA, but also for Europe, including the UK (Lavers et al., 2012), Norway (Sodemann, H. and A. Stohl, 2013) and also another example in Italy as point out by reviewer #2 (Malguzzi et al., 2006). We have included a new reference to support the Italian event Malguzzi et al (2006).

Additional references:

Malguzzi P., G. Grossi, A. Buzzi, R. Ranzi, R. Buizza 2006 The 1966 "century" flood in Italy: A meteorological and hydrological revisitation. Journal of Geophysical Research: Atmospheres 111, D24

Sodemann, H. and A. Stohl, 2013: Moisture Origin and Meridional Transport in Atmospheric Rivers and Their Association with Multiple Cyclones. Mon. Wea. Rev., 141,2850–2868

Pereira, S., Ramos, A. M., Zêzere, J. L., Trigo, R. M., and Vaquero, J. M. (2016) Spatial impact and triggering conditions of the exceptional hydro-geomorphological event of December 1909 in Iberia, Nat. Hazards Earth Syst. Sci., 16, 371-390, https://doi.org/10.5194/nhess-16-371-2016

Trigo, R. M., Varino, F., Ramos, A. M., Valente, M., Zêzere, J. L., Vaquero, J. M., Gouveia, C. M., and Russo, A.: The record precipitation and flood event in Iberia in December 1876: description and synoptic analysis, Front. Earth Sci., 2, 1–15,

However, I have the feeling that the above mentioned conclusions are pushed too far with respect to the real achievements of the analysis reported in the paper: the simultaneous occurrence of different events is in itself no proof of a cause-effect relationship between them and, even less, of a predictive potential.

My scepticism is based on personal experience in trying to identify "precursors" of relevant tropospheric developments. Specifically: in early seventies, following Ed Danielsen (1964,1968,1970), I participated in the search for correlation between tropospheric folding and alpine cyclogenesis (Nanni et al. 1975), but studies on the subject eventually revealed that although stratospheric air enhances signals (due to its very low density) it is too tenuous to exert any real "forcing" on the troposphere below and, in fact, its analysis does not improve the prediction skill of intense Mediterranean cyclones; a few years later we went through a similar experience in studies concerning the relationship between stratospheric warming and blocking: sudden stratospheric warming eventually resulted to be the consequence and not the cause of tropospheric blocking.

In conclusion, my feeling is that the conclusive statements of the paper are too generic and I would suggest either to moderate the expectations or be more specific about the physical mechanism alluded to and the associated enhancement in the predictability of high impact weather associated with explosive cyclones.

This is a fair comment, which we partially agree with. Also following the comments by the other reviewers, we have changed the pertinent text and made an effort to "moderate the expectation" regarding the content of the paper.

Danielsen, E. F.: Report on Project Springfield, Headquarters, Defense Atomic Support

Agency, Washington D. C. 20301, 15 July 1964.
Danielsen, E. F.: Stratospheric-Tropospheric Exchange Based on Radioactivity, Ozone and Potential Vorticity. J. Atmos. Sci., 25, 502 (1968).
Danielsen, E.F., R. Bleck, J. Shedlovsky, A. Wartburg, P. Haagenson, and W. Pollock: Observed Distribution of Radioactivity, Ozone and Potential Vorticity Associated with Tropopause Folding. J. Geophys. Res., 75, 2353 (1970).
Nanni T., A. Speranza, A. Trevisan and 0. Vittori, 1975: "Precipitation of stratospheric tracers and cyclogenesis in the Western Mediterranean". Arch. Met. Geoph. Biokl., A 24, 321-328.