

We thank the reviewers for the additional suggestions. We did our best to address all comments. We here respond to each point raised by the Reviewer 2 (reviewer comments in blue, with our response in black).

Reviewer #2

I appreciate the authors' efforts to revise the manuscript based on the reviewers' comments. In particular, Appendix D helps readers understand the relationship between the PV-based classification and medicanes. I would like the authors to think about the following minor points before the publication of this paper.

Thank you, we agree that extending the discussion to include Medicanes does add value to the manuscript.

1. Lines 501-502: What do the authors mean by cyclonic and anticyclonic tilts?

Thank you for the opportunity to rephrase this term. To avoid confusion with vertical tilt, we now use the term "curvature" to describe the direction in which the PV features rotate. E.g., the PV feature shown in the composite of cluster 2 (Fig. 3 in the main text) shows anticyclonic curvature in its northeastern part, and cyclonic curvature closer to the cyclone center.

2. Fig. B1: If possible, denote which direction is the north in the figure, or replace "(viewed from the) northeast" with "east-northeast" for accuracy.

Thank you for this remark, the axes orientation was added for clarity and the captions were changed as suggested.

3. Lines 738-740: This sentence should be rephrased without using "respectively" to link the three cluster numbers with the relevant cluster characteristics more clearly.

The sentence was split into the following two sentences:

"While too few cases are considered to make conclusive statements, it appears that most winter Medicanes are captured as a stage B lee cyclone (cluster 4) and AWB+CWB cyclones (cluster 2, 25% of the Medicanes each). Autumn cases are mostly captured as short-wave cut-off lows (cluster 9) that form another 25% of the Medicanes."