

Reply to the Co-Editor

We thank the co-editor Irina Rudeva for providing further comments on our revised manuscript. A point-by-point response to these comments can be found below. The co-editor's comments are in black and our response are in blue.

I.270-275, 'poleward flow to the east enhances the poleward motion of the low-level cyclone, which can contribute to cyclone intensification when it crosses the upper-level jet axis Fig. 5e': If I got it right, cyclones were identified in the SLP field, meaning that the low-level center is already to the north of the jet axis.

Yes, you are right. We have modified this passage to make clearer what we mean:

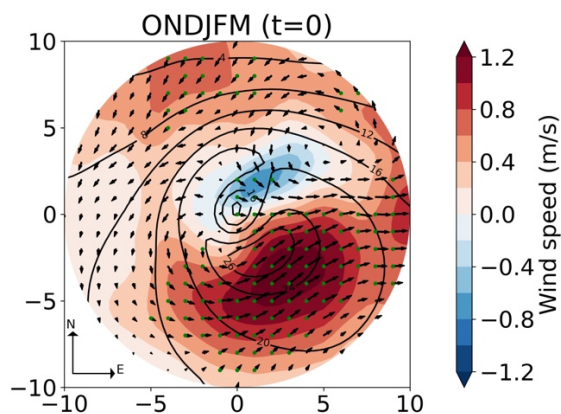
The poleward flow to the east enhances the poleward motion of the low-level cyclone. Assuming that this poleward flow has also persisted in the period before maximum cyclone intensity, it may have contributed to cyclone intensification when the system crossed the upper-level jet axis (Riviere et al., 2013; Tamarin and Kaspi, 2017).

I.291, 'the wind increases are more robust than the decreases across the ensemble members': I don't think this is true for 5f. In 5d, the disagreement maybe a result of small shifts in the location of the negative anomaly between ensemble members. By the way, the color scale in 5d is either non-linear or suggests two digits after the decimal point.

a) We agree with your observation; in Fig. 5f, the wind increases are robust and wind decreases as well. We have modified the sentence as below:

Note that, at low levels, the wind increases are more robust than the decreases across the ensemble members (see the green dots in Fig. 5d), which might be due to small shifts in the location of the negative anomaly between ensemble members.

b) The color bar in Fig 5d is not linear and it could be confusing. Thus, we have decided to make it linear (every 0.2 m/s):



l.202: the months of October-March

Thank you, we have modified the sentence to:

... the months of October-March ...

l.206: 'averaged over a radial cap of a radius of 250 km ' -> averaged over a radius of 250 km

Thank you, we have modified the sentence to:

... averaged over a radius of 250 km ...

363: using a Lagrangian approach

Thank you, we have modified the sentence to:

... in the second part of this study using a Lagrangian approach.

l.367: perhaps, 'complemented' is better; also, merge with previous paragraph.

Thanks, we have merged it with the previous paragraph and changed the sentence in line 367 to:

This qualitative discussion will be complemented by quantitative PPVI results below.

l.383: perhaps, 'upper-level PV future changes for extreme cyclones differ more substantially from those for intense cyclone'

Thanks, we have modified the sentence in line 383 to:

In contrast to the lower troposphere, upper-level PV changes for extreme cyclones differ more substantially from those for intense cyclone.