**Comment 3:**

Specificity added. See L60–61.

**Comment 4:**

I added discussion on the formation of the dual upper-tropospheric jet streaks. See L110–118.

**Comment 5:**

Yes, added a statement regarding change of vertical tilt. See L118–121.

**Comment 6:**

I added discussion on “starburst” irrotational wind pattern. See L128–131.

**Comment 7:**

I now link back to the “starburst” irrotational wind pattern. See L136–139.

**Comment 8:**

I feel that with the limited time I have left, I will not be able to construct and analyze cross sections. However, I would like to construct and analyze cross sections in the future for publication purposes.

**Comments 9 and 11:**

I made the white stippling bigger in Figs. 4.7–4.11 and now enclose regions of stippling by a thicker white contour.

My intention was that the statement: “Sensitivity of *J*AC to 250-hPa PV area averaged within 200 km of each grid point (hPa; shading)” defines the colorbar in the Fig. 4.7 caption. To equate the colors from the colorbar directly to the sensitivity patterns, I added the following statements to the Fig. 4.7 caption:

“Positive values of sensitivity given by warm colors indicate that increasing 250-hPa PV area averaged within 200 km of each grid point correlates with a decrease in *J*AC and thus correlates with a more accurate prediction of AC16. Negative values of sensitivity given by cool colors indicate that decreasing 250-hPa PV area averaged within 200 km of each grid point correlates with a decrease in *J*AC and thus with a more accurate prediction of AC16.”

**Comment 10:**

I added labels to Figs. 4.7, 4.8, and 4.13 to show the positions of key troughs and ridges that are now defined in the text.

**Comment 13:**

Specificity added. See L198–199.

**Comment 15.**

I added a sentence on L157–158 at the beginning of the ESA results section to direct readers to Fig. 1.2, which contains a map of Arctic geographical features that are discussed in chapter 4. I also added a label for Novaya Zemlya in Fig. 1.2.

**Comments 16 and 19:**

Based on the ESA results, I do think that the position of the moisture corridor and region of latent heating with respect to AC16 may matter more to the predictability of AC16 than the amount of moisture in the moisture corridor and than the magnitude of latent heating. I added a statement on L226–228 to address this.

**Comments 17, 20:**

Agreed, I should have been more thorough with the cited literature. I added several citations to papers on L262–263.

**Comment 21:**

I added an additional statement to note that forecast errors propagating as structures resembling wave-packets can originate well upstream of ACs, including in the middle latitudes, as shown for AC16. See L270–272.

**Comments 22 and 24:**

I anticipate that a more amplified thickness trough may be associated with greater thermal vorticity, such that there may be greater advection of thermal vorticity by the thermal wind over AC16 that may contribute to greater development and intensification of AC16.

I added this discussion on L313–318.

**Comment 23:**

I added a statement about the formation of the dual jet streaks on L304–308.

**Comment 25:**

I gave Fig. 4.13 a “haircut” by increasing the minimum value of irrotational wind that is plotted.

**Comment 26:**

I anticipate that a more amplified upper-tropospheric flow establishes greater upper-tropospheric divergence and irrotational outflow, which contributes to greater development and intensification of AC16. Therefore the chicken may be the more amplified upper-tropospheric flow and associated greater upper-tropospheric irrotational outflow and divergence, and the egg may be the development and intensification of AC16.

**Comment 27:**

Altered sentence to make it less awkward. See L337–340.

**Comment 28:**

I discuss more about the increase in IMFC on L352–360.

**Comment 29:**

I add a statement regarding the comparable Eady growth rates between the most and least-accurate ensemble forecast on L372–375.

I added new discussion regarding why there may be significant differences in IVT and irrotational wind, but not IMFC on L402–418.

**Comment 30:**

My response to comment 29 regarding IVT, IMFC, and irrotational wind magnitude (see L402–418) also applies to this comment.

**Comment 31:**

I think that the comparable lower-to-midtropospheric Eady growth rates relates to the comparable lower-to-midtropospheric baroclinicity between the most-accurate and least-accurate ensemble forecasts (as stated in my response to comment 29). The more amplified and stronger upstream upper-tropospheric trough and embedded TPV, and a correspondingly stronger AC16, in the most-accurate ensemble forecasts may interact more strongly with the region of lower-to-midtropospheric baroclinicity.

**Comment 32:**

I think it is possible that there may be less moisture beneath a stronger TPV. However, I would also expect a stronger TPV to potentially lead to a stronger surface cyclone that may advect moisture more poleward downstream of the TPV and cyclone.

**Comment 33:**

I think both the location and magnitude of the dynamical forcing matter. A more amplified and stronger upper-tropospheric trough and embedded TPV may have greater dynamical forcing that contributes to a stronger AC16 in the most-accurate ensemble forecasts. The more amplified and stronger upper-tropospheric trough and embedded TPV may also be better positioned with respect to the region of strong lower-to-midtropospheric baroclinicity in the vicinity of AC16 to contribute to greater intensification of AC16 in the most-accurate ensemble forecasts. With a stronger AC16, there will concomitantly be greater amplification of the lower-tropospheric thickness trough and ridge in the vicinity of AC16, and greater amplification of the upper-tropospheric flow. Changes in the position and amplitude of the thickness trough and ridge and in the upper-tropospheric flow amplitude will be associated with changes in the location and magnitude of dynamical forcing throughout the forecasts.