Dear Dr. Rousseau-Rizzi

We consider ourselves fortunate to receive this exceptionally helpful review. Your deep expertise has provided key insights that will strengthen our paper and clarify our findings.

This note serves as our public response to the major points raised in your review so that you and those following this discussion may get our take on the comments. A more formal point-by-point response will be forthcoming. We respond here to the main comments concerning the connection to PI theory and the numerical domain size. We are also working to address all comments and incorporate all suggestions.

1) Comparison to PI Theory

Thank you for alerting us to thermodynamic disequilibrium as a missed and potentially important piece connecting our modeling and theory. We agree that our substantial SST changes could affect disequilibrium. However, our corresponding changes to low level temperature may lessen any changes. We are computing the thermodynamic disequilibrium values across our simulations to explore this line of inquiry.

The suggested papers are highly relevant. After reading these papers we have a better understanding of why storm intensity peaks, then decays in the axisymmetric simulations (due to artificial drying in the subsiding branch). In our modeling, we suggest that this is less of an issue since we are studying the earlier peak in intensity (which we shall be sure to state correctly). But we shall certainly refer to this to help interpretation. Thank you also for pointing out the Carnot vs. CAPE-based forms of E-PI. This is something we had not fully appreciated before receiving your review.

Your comment about E-PI being most sensitive to temperatures near the surface and at the outflow level is well made. We shall certainty emphasize these levels in a revised interpretation. In addition, we shall add some discussion of the basin-dependency of seasonal variations in the outflow reaching the lower stratosphere.

2) Numerical domain size

We are sorry for incorrectly stating our domain size to be 768 km in the original submission. We had overlooked the fact that we used a stretched grid, where an outer portion of the domain (at radial distances greater than 280 km) stretches to larger grid spacing. The domain size reported in the paper is therefore incorrect: It is 1500 km in the radial direction. We will of course update this in the revised paper.

We therefore suggest domain size is a less serious issue than it first appeared. To demonstrate this, we are making domain size sensitivity runs to confirm that the sensitivity is small compared to changes in physics options or responses to temperature

profile change. These larger domain runs double the radial distance to 3000 km and also double the radial distance beyond which stretching begins (to 560 km).