Dear Reviewer One

Thank you for your careful and extremely valuable review. You make many important points that will strengthen and help clarify our work.

This note serves as our public response to the main 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 your main comments concerning the limitations of axisymmetric modeling, improvement of figures, and the treatment of humidity. We are also working to address all comments and incorporate all suggestions.

1) Limitations of axisymmetric modeling

Thank you for the note of caution concerning the applicability of axisymmetric model results. We agree that we over-generalized and over-extended the applicability of axisymmetric modeling throughout the paper. In our revised manuscript we shall take care to state the limitations of axisymmetric models, including stating the missed processes, and use this to interpret our results more accurately.

2) Clarity of figures

Your comment about the lack of clarity in our figures is well made. We are changing the colors to better distinguish the line plots and to adhere to color blindness standards. In looking further at Fig. 1b, we believe that the lack of clarity is due to more than just color contrasts. We will split this figure into separate panels to show the different temperature profiles more clearly.

3) Treatment of Humidity

We agree that our treatment of humidity was not clearly stated. We keep relative humidity (RH) constant, which results in increased water vapor content with warming. Some justification for this assumption is based on observations of RH to be nearly constant over the ocean over the range of seasonal temperature variation (e.g., Dai 2006; Willett et al. 2007). If RH is maintained over that large temperature range, then it is reasonable to assume that it would also be maintained over much smaller temperature increments.

Dai, A.: Recent climatology, variability, and trends in global surface humidity, J. Climate, 19, 2589–3606, https://doi.org/10.1175/JCLI3816.1, 2006.

Willett, K. M., N. P. Gillett, P. D. Jones, and P. W. Thorne, 2007: Attribution of observed surface humidity changes to human influence. Nature, 449, 710–712.