

## Review of “Nicholls et al.”

The authors explored the physical mechanisms for radiation to accelerate tropical cyclogenesis and impact of diurnal cycles. The manuscript’s premise is interesting and important. In addition, the manuscript is generally well written, and it is relatively easy to follow the authors’ logic.

Before accepting this manuscript for publication in ACP, I suggest that the manuscript would benefit from:

(1) a complete bibliography and discussion of previous work related to the numerical modeling and influence of radiation of TCs (some of recommended works are listed at the end), regardless of whether these works specifically address cyclogenesis, they address many key ideas (e.g., radiation induced destabilization, the diurnal cycle of TCs, moistening of tropical disturbances, and upper level outflow in TCs) in this paper;

(2) clarifying the innovation of the paper;

(3) improving the quality of figures and representation

I reserve comments on minor issues at this time, because the revised version addressing the major issues above should result in a substantially different manuscript.

Fovell, K. L. Bu, Y. P. Corbosiero, W. Tung, Y. Cao, H. Kuo, L. Hsu, and H. Su, 2016: Influence of cloud microphysics and radiation on tropical cyclone structure and motion. *Multiscale Convection-Coupled Systems in the Tropics: A Tribute to Dr. Michio Yanai*, Meteor. Monogr., No. 56, Amer. Meteor. Soc., <https://doi.org/10.1175/AMSMONOGRAPHS-D-15-0006.1>.

Caroline J. Muller, David M. Romps, 2018: Acceleration of tropical cyclogenesis by self-aggregation feedbacks, *Proceedings of the National Academy of Sciences*, 115 (12),2930-2935; DOI: 10.1073/pnas.1719967115

Navarro, E.L. and G.J. Hakim, 2016: Idealized numerical modeling of the diurnal cycle of tropical cyclones. *J. Atmos. Sci.*, **73**, DOI: 10.1175/JAS-D-15-0349.1 .

Navarro, Hakim, and H. E. Willoughby, 2017: Balanced response of an axisymmetric

- tropical cyclone to periodic diurnal heating. *J. Atmos. Sci.*, 74 (10), 3325–3337
- Tang X, Z. Tan, J. Fang, Q. Sun, and F. Zhang, 2017: Impacts of diurnal radiation cycle on secondary eyewall formation. *J. Atmos. Sci.*, 74, 3079–3098, <https://doi.org/10.1175/JAS-D-17-0020.1>.
- Tang, X., Z.-M. Tan, J. Fang, E. B. Munsell, and F. Zhang, 2019: Impact of the diurnal radiation contrast on the contraction of radius of maximum wind during intensification of hurricane Edouard (2014). *Journal of the Atmospheric Sciences*, 76 (2), 421–432.
- Tang, X., Cai, Q., Fang, J., & Tan, Z. M. (2019). Land–sea contrast in the diurnal variation of precipitation from landfalling tropical cyclones. *Journal of Geophysical Research: Atmospheres*. Doi: 10.1029/2019JD031454, <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2019JD031454>
- Trabing, B. C., M. M. Bell, and B. R. Brown, 2019: Impacts of Radiation and Upper Tropospheric Temperatures on Tropical Cyclone Structure and Intensity. *J. Atmos. Sci.*, 76, 135-153.