

Interactive comment on “An examination of two pathway to tropical cyclogenesis occurring in idealized simulations with a cloud-resolving numerical model” by M. E. Nicholls and M. T. Montgomery

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Thank you for your careful review that we will respond fully to in due course. Regarding your comment that “in the end we do not know why either pathway one or two would be preferred in a given set of circumstances”. We have shown that the ice phase is an important factor and that warmer sea surface temperatures that lead to a greater production of ice are more favorable for development along pathway two. But an important conclusion of this study is that the initial value problem appears to be near a bifurcation point. It may not be a strict bifurcation since convection has a random

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nature and events might occur that could tip the evolution one way or the other. All the simulations of Montgomery et al. (2006) evolved along pathway one, while all the simulations of Nolan (2007) evolved along pathway two. This suggests that differences in model physics can determine which pathway the system evolves along. This is the first study that shows both pathways occurring with a given model configuration and physics. Showing that the ice phase is important is significant progress in understanding these different evolutions. New simulations with two-moment microphysics are still showing both pathways occurring. At this stage it would be very interesting if observational verification of the existence of the second pathway could be obtained.

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