

Interactive comment on “A numerical study of convection in rainbands of Typhoon Morakot (2009) with extreme rainfall: roles of pressure perturbations with low-level wind maxima” by C.-C. Wang et al.

Anonymous Referee #2

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General Comments: This manuscript investigates the formation and evolution of deep convection inside Typhoon Morakot's rainband using CReSS model. The authors then discuss the back-building mechanisms and how the distributions of the dynamical pressure favored the new development of updraft on the west side (upstream) of a mature cell. The results appeared plausible and in general consistent with observations.

This paper should be accepted for publication after major revision. Specific comments are listed below.

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Major Comments:

1. The authors should be congratulated with this great simulation. What is the potential for CReSS to perform real-time TC prediction?
2. It is somewhat disappointing that the authors did not compare their results with ample radar observations on this particular rainband. Although radar observations were shown in Fig. 4, it would be helpful to show observed cells indeed went through this sequence. Some of the black arrows (indicating the sequence of back building) in Fig. 4 are not obvious. It is difficult to compare vertical velocity (Fig. 8) with reflectivity (Fig. 4). Perhaps the authors can pick one or two cells in the radar observations to demonstrate their life cycle.
3. Please clarify the meaning of LLJ. Was this LLJ a synoptic scale feature that this rainband took advantages of growing on top of it or it was a mesoscale feature accompanied by this rainband. For example, did each rainband in the simulation accompanied by a distinct LLJ or the LLJ is a scale larger than the individual rainband. The formation and/or the source of the LLJ may be one of the key issues to characterize this type of rainband.
4. The figures are hard to interpret with distance represented in longitude. The authors should consider using km rather than lat and lon for the axes. Other than Fig. 9, there is no distance scale in other figures.

Minor Comments:

1. Fig. 9 can include a vertical motion plot as panel (c) rather than having to refer back to Fig. 8a.
2. Is there a reason Fig. 10 a and b showing two different cross-sections? It is confusing as the readers may compare the structures shown in 10 a and b then find out they are not suppose to do so.

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