

Weather Clim. Dynam. Discuss., referee comment RC2
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Comment on wcd-2020-64

Anonymous Referee #2

Referee comment on "Zonal scale and temporal variability of the Asian monsoon anticyclone in an idealised numerical model" by Philip Rupp and Peter Haynes, Weather Clim. Dynam. Discuss., <https://doi.org/10.5194/wcd-2020-64-RC2>, 2021

This paper describes an idealized model of the Asian monsoon anticyclone using a dry dynamical core model, to analyze the interactions of localized monsoon forcing and midlatitude baroclinic eddies. The paper focuses on understanding the model sensitivity to monsoon strength and imposed background circulation, and the results nicely highlight the region of active dynamics on the poleward side of the anticyclone. The key points include that the midlatitude eddy interactions lead to a zonal localization of the monsoon circulation, and eastward/westward eddy shedding occurs spontaneously in the model depending on parameter settings. The zonal localization from eddy interactions helps address the issue of overly strong dissipation required in previous idealized models, and the sensitivity of the model eddy shedding to model parameters helps identify the underlying processes in a simplified setting. The paper does a good job of placing this work in context of previous modeling work and observations. The results are interesting and novel and the paper is well written; I enjoyed reading it very much. I have only minor comments for the authors to consider in revision.

I suggest including a few additional recent references and related discussions:

Sui and Bowman (2019) regarding monsoon modeling DOI:10.1175/JAS-D-18-0340.1

Siu and Bowman (2020) for analysis of sub-vortices and eddy shedding 10.1175/JAS-D-19-0349.1

Honomichl and Pan (2020) for analysis of eddy shedding 10.1029/2019JD032094

Line 353: Fig. 5 should be Fig. 6

The sensitivity to anticyclone forcing demonstrated in Fig. 11 is nice. What controls the westward phase speed of the eddies for the $Q=5$ K/day case? Are these Rossby waves? What is going on with the traveling eddies centered near 15 S (also in Fig. 12)?

Line 525 and following: it is useful to cite the more recent analyses of Siu and Bowman (2020) and Honomichl and Pan (2020) regarding observations of sub-vortices, eddy shedding and 'bi-modality'.