

Interactive comment on “Intraseasonal summer rainfall variability over China in the MetUM GA6 and GC2 configurations” by Claudia Christine Stephan et al.

Anonymous Referee #2

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In this manuscript, the authors investigate the role of coupling, resolution, and decadal variability on the simulation of intraseasonal summer variability over China using the MetUM climate model. This is a nice contribution to the climate modeling and prediction community efforts in understanding the relative importance of these factors for reducing the biases of climate models and improving the model prediction skill.

I have only major comment that the authors should address. Section 5: The higher correlation value of the EOT patterns in the uncoupled simulations suggests that these patterns might be driven by the SST rather than the atmospheric variability. The authors should consider evaluating the SST biases of the coupled simulations. Understanding

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the role of coupling is not trivial because coupled models have biases that can interfere with the air-sea interaction processes.

Minor comments: Introduction: L 25 model formulation needs to be clarified Section 2.1: L25 naming convection-> naming convention Figure 4c does not show fractional contributions to daily precipitation totals in observations. Section 4: The slope of the autocorrelation curves is consistent between the model and observations. Define what is meant by the decorrelation time.

Section 5: At pentad -1 a negative Z500 anomaly is located over the northwest Pacific.

Discussion: The authors speculate that parameterization of convection can be another cause of the model biases. There are a few studies showing the impact of cloud processes parameterization of the simulation of summer rainfall variability over China (e.g., Chen et al. 2010, DeMott et al. 2013, Jin and Stan 2016).

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DeMott, C. A., C. Stan, and D. A. Randall, 2013: Northward propagation mechanisms of the boreal summer intraseasonal oscillation in the ERA-Interim and SP-CCSM. *J. Climate*, 26, 1973-1992, doi:10.1175/JCLI-D-12-00191.1

Jin, Y., and C. Stan, 2016: Simulation of East Asian Summer Monsoon (EASM) in SP-CCSM4. Part I: Seasonal mean state and intraseasonal variability. *J. Geophys. Res.*, 121, 7801-7818, doi:10.1002/2015JD024035.

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