Barrier effect of the Maritime Continent on the MJO in global models

*Chidong Zhang[1], Jian Ling[2]

1. NOAA Pacific Marine Environmental Laboratory, 2. State Key Laboratory of Numerical Modelling for Atmospheric Sciences and Geophysical Fluid Dynamics (LASG), Institute of Atmospheric Physics (IAP), Chinese Academy of sciences (CAS)

Using a method of tracking individual MJO events, we diagnose MJO simuations by 27 global models. First, we found the commonly accepted perseption that some models produce the MJO and other do not is incorrect. All diagnosed MJO produce the MJO, but some do frequently, others infrequently. Second, we found all models suffer from a common bias: their simulated MJO events starts evenly over the Indo-Pacific region, while the observed MJO start mostly over the Indian Ocean. Third, the barrier effect of the Maritime Contiment on the MJO is very different among the models. The "exaggerated barrier effect" is found only in some models. In other, there is no barrier effect. The exaggerated barrier effect is evident in models that produce weak overal statistical signals of the MJO. These results suggest that the mean state is a key factor for MJO simulations and barrier effect in them. This, however, may not be the reason for the barrier effect in observations.

Keywords: Madden-Julian Oscillation (MJO), Maritime Continent, Barrier effect, global model simulations

©2017. Japan Geoscience Union. All Right Reserved.