The Different Pathways to self-aggregation between SCALE and VVM

*Ching-Shu Hung[1], Hiroaki Miura[1], Jin-De Huang[2], Chien-Ming Wu[2]

1. The University of Tokyo, 2. National Taiwan University

In this study, self-aggregation simulations following Wing et al. (2018) are conducted focusing on the development toward self-aggregation by two cloud-resolving models (SCALE and VVM). Even though the two models reach self-aggregation state after 40 days of simulations, the pathways toward aggregation are very different given the same sea surface temperature. The dry area expansion through radiative cooling is evident in SCALE which effectively shrinks the moist region while VVM takes a different route through the convection development in the moist region. The subsidence induced by the convection organization further enhances the expansion of the dry region leading to the self-aggregation. The isentropic analyses show that the aggregation in SCALE is through the development of strong shallow circulation while it is through the subsidence warming from aloft in VVM. The time evolution of convective core clouds distribution can be a precursor of the different pathway.

Keywords: self-aggregation

©2021. Japan Geoscience Union. All Right Reserved.