



Organization of tropical convection in low vertical wind shears: impact of boundary conditions

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Spontaneous organisation of convection is investigated using a cloud resolving model with a convection permitting horizontal resolution of 2 km. Convection spontaneously organises into clusters occurring in a single moist region surrounded by a dry convection-free region, reproducing the results of previous studies using a range of different models. Energy budget diagnostics are used to confirm the diabatic processes that lead to, or oppose, organisation as the simulations progress. A range of sensitivity experiments are then conducted to document the strength of the organisation to the representation of the sub-grid mixing, which confirm how the entrainment mixing into updraughts is key to the strength of the organised state. Schemes that produce low entrainment in the lower free-troposphere can destroy the organised state. Experiments are then conducted using a slab ocean lower boundary. Convection is still organised when using an interactive lower surface, as expected, but the degree of convective clustering in the moist region and the large-scale water vapour structures are altered, with sharper gradients and stronger bimodality. The mechanisms for this will be discussed.