



Influence of Offshore Initial Moisture Field and Convection on the Development of Coastal Convection in a Heavy Rainfall Event over South China during the Pre-summer Rainy Season

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This paper utilizes the observation data from the Southern China Monsoon Rainfall Experiment (SCMREX) and the numerical experiments to investigate the influence of moisture amount and convection development over the northern South China Sea on a heavy rainfall event in coastal South China on May 8, 2014. Intensive sounding and wind profiles data reveal that there existed a convergence region formed by the southwesterly and easterly jet in the Pearl River delta, which provided favorable conditions for the development of convection. Whether the initial relative humidity field was increased or decreased in the offshore area, or turning off sensible and latent heat release from the cumulus and microphysical processes, had significant effects on the intensity and movement of convection in the coastal areas of Guangdong owing to the adjustment of temperature and wind fields. Especially, when increasing offshore initial humidity, prosperous sea convection modified the circulation in the entire simulation area, and suppressed the development of convection over land. Moreover, if sensible and latent heat from cumulus and microphysical processes was turned off, the low-level jets could reach further north, and the convective system moved to the northeast in the later stage. These experiments indicate that offshore initial moisture field and convection activity are indeed important for precipitation forecast in the coastal areas, therefore it's necessary to enhance offshore observation and data assimilation methods in the future.