

Séminaire de Sylvia Sullivan au LMD

Name : Séminaire de Sylvia Sullivan au LMD

Title : From environmental moisture to precipitation intensity in tropical convective systems

Laboratory :

Name of the speaker :

Affiliation :

Date and time : 26-02-2020 14h00

Location : Ecole normale supérieure, 24 rue Lhomond, 75005 Paris - Salle Froidevaux - E314 - 3ème étage (bouton ascenseur 6)

Summary :

In the tropics, the majority of high-intensity precipitation comes from the organization of multiple convective cells into convective systems (CS). Environmental moisture can affect these precipitation intensities in a multiplicity of ways. For example, while precipitation onset occurs beyond a threshold in column water vapor content, lower tropospheric drying can also enhance instability and ascent rate. We investigate these moisture-precipitation relationships for tropical CS semi-observationally with satellite data and high-resolution reanalysis values. In particular, the long duration of these datasets allows us to establish robust shifts in the precipitation intensity distribution with the El Niño Southern Oscillation and to explain them on the basis of a vertical momentum budget. Given the role of free tropospheric relative humidity in this budget, we proceed to examine how the relations of precipitation intensity, saturation deficit, and instability differ with spatiotemporal scale and in idealized simulations versus observations. Organized convective activity can affect not just local but also remote precipitation intensities, and we give an outlook on the utility of causal algorithms here.

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