A closer look at the climatology of tropical precipitation.

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We present a very high-resolution $(0.05^{\circ} \times 0.05^{\circ})$, about 5km x 5km) monthly climatology and 3hourly diurnal cycle of precipitation, as derived from the precipitation radar (PR) aboard TRMM. The combination of the high spatial detail and of the use of a single instrument and uniform retrieval method for land and ocean precipitation alike allows us to better understand the role of orography, surface type, and surface temperature in shaping the spatial pattern of climatological rainfall.

We further analyze this dataset to show how variations in the frequency of precipitation events dominate over variations in the mean intensity of precipitation to determine local rain rates. In some regions of the tropics, diurnally locked local circulations are largely responsible for sharp gradients in the spatial distribution of precipitation frequency and seasonal mean precipitation. In other regions, we show that climatological rainfall frequency changes very sharply at coastlines, even though rainfall in these regions is expected to be controlled by relatively large scale weather systems.

Spatial variations in intensity do not show sharp gradients but have a large-scale character. They indicate a preference for the most intense rainfall to occur in locations and at times when rainfall is relatively infrequent (but not rare). We suggest that regions of frequent rainfall and regions of intense rainfall might influence the stability of the tropical troposphere in different fashions.