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# On the relationship between precipitation and its spatial patterning in the Trades

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Scenes of trade wind convection exhibit a rich spatial variability characterized by patterns, which are often associated with precipitation. Precipitation might be a key to understand the spatial patterning in shallow convection. However, the spatial patterning of precipitation is largely unexplored. We exploit observational data from the C-band radar PoldiRad installed during the EUREC4A measurement campaign to analyse the relationship between precipitation and its spatial patterning. Do details of the spatial distribution matter for precipitation? We analyse three characteristics that shape our perception of spatial patterns - the number, size and spatial arrangement of cells and further how water vapor availability influences precipitation by mediating changes in the spatial structure.

We conclude that scene precipitation and precipitation intensity are influenced by different characteristics of the spatial structure. The scene-averaged precipitation is highest where cells are both large and numerous but do not exhibit the highest degree of clustering. Precipitation intensity on the other hand varies predominately with the size of cells, but the variation depends on the moisture regime. Highest intensities are found in scenes with a few large cells characterized by a low water vapor path. Here also clustering maximizes. This suggests that clustering is important for precipitation formation in dry environments and acts by protecting cells from their hostile dry environment which enables them to gain a certain size and rain more intense. Overall, however, scene precipitation and clustering are negatively correlated.

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