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Can cold pool currents serve as a predictor of subsequent precipitation events?

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Cold pools resulting from convective precipitation have been linked to the initiation of new convective cells and to the intensification of such cells. Yet there are still important unresolved questions regarding how and under which conditions cold pools can initiate new events. Cold pools are characterized by their relatively low temperature when compared to their surroundings and characteristic variations in specific humidity, i.e. reductions in their center but also enhanced humidity near their fronts. Due to enhanced buoyancy, the latter can lead to vertical lifting at the outer boundaries, sometimes setting off new convective clouds. However, an additional, perhaps dominant, mechanism is that cold pools originating from different convective events can collide and thereby also serve as a triggering mechanism for new convective clouds. The aim of this study is to set up a simple tracking code, which is able to locate the front of a cold pool. This is sought done by first identifying the cold pools by taking advantage of their close connection with precipitation and their strong effect on temperature. One pixel will experience a cold pool front as a sudden drop in temperature followed by gradual recovery. Another interesting variable, which we will try to implement in the tracking algorithm, is the radial velocity. This variable is possibly a very effective indicator for cold pool collisions and it is less dependent on how temperature changes as the cold pool ages, why it would be a good complementation to the use of temperature. The principal research question we aim to address is to what extent new convective events are caused by colliding cold pools and whether it is possible to predict when and where new convective events occur. We test our algorithm using high-resolution LES simulations and further on we wish to apply our findings to high-resolution observational data over a flat tropical sea surface.