

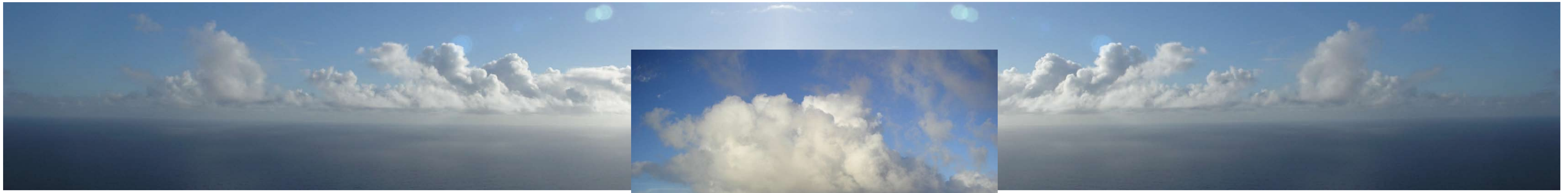
# Radar analysis of the evolution of trade wind clouds observed during the Rain in Cumulus over the Ocean



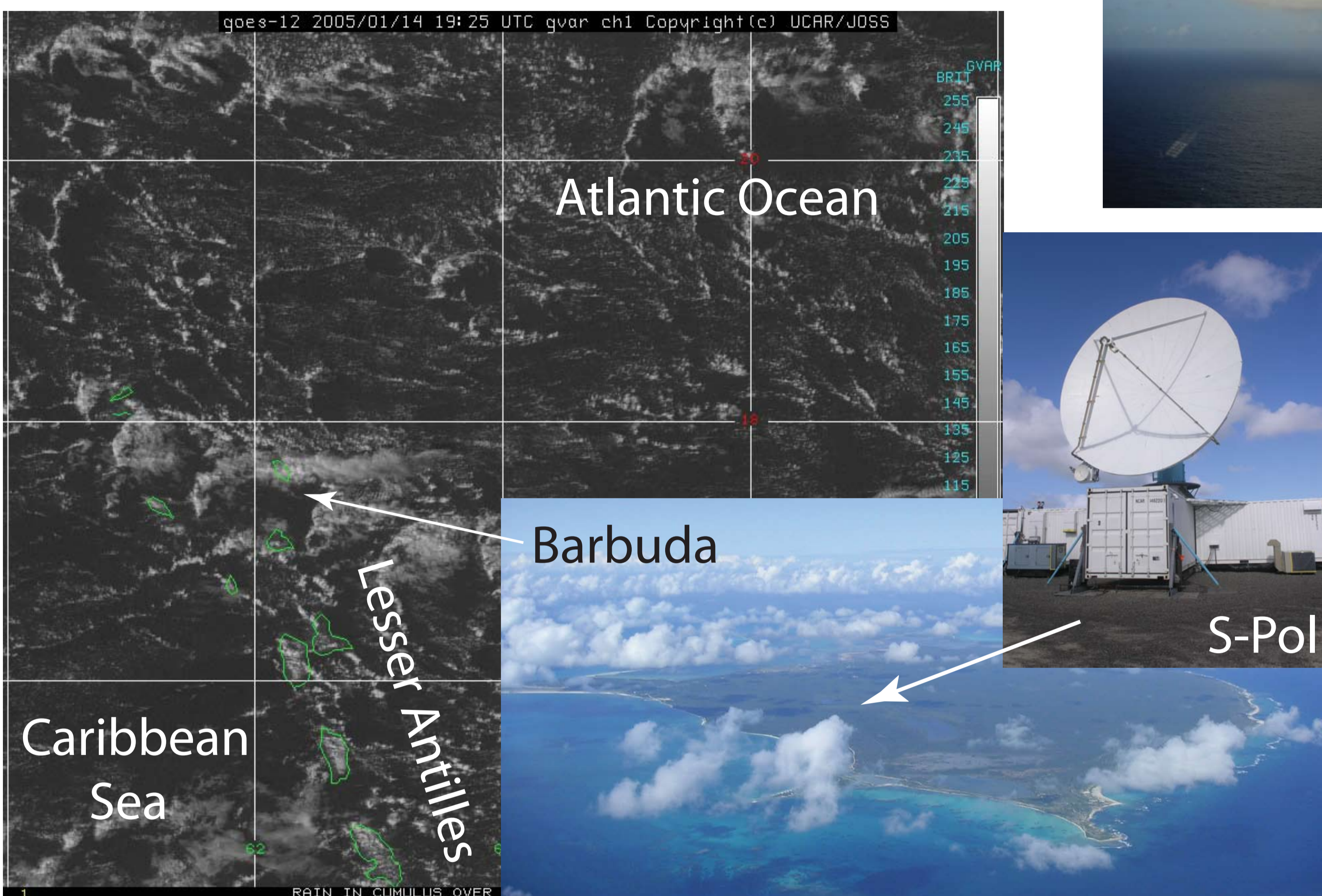
## field experiment

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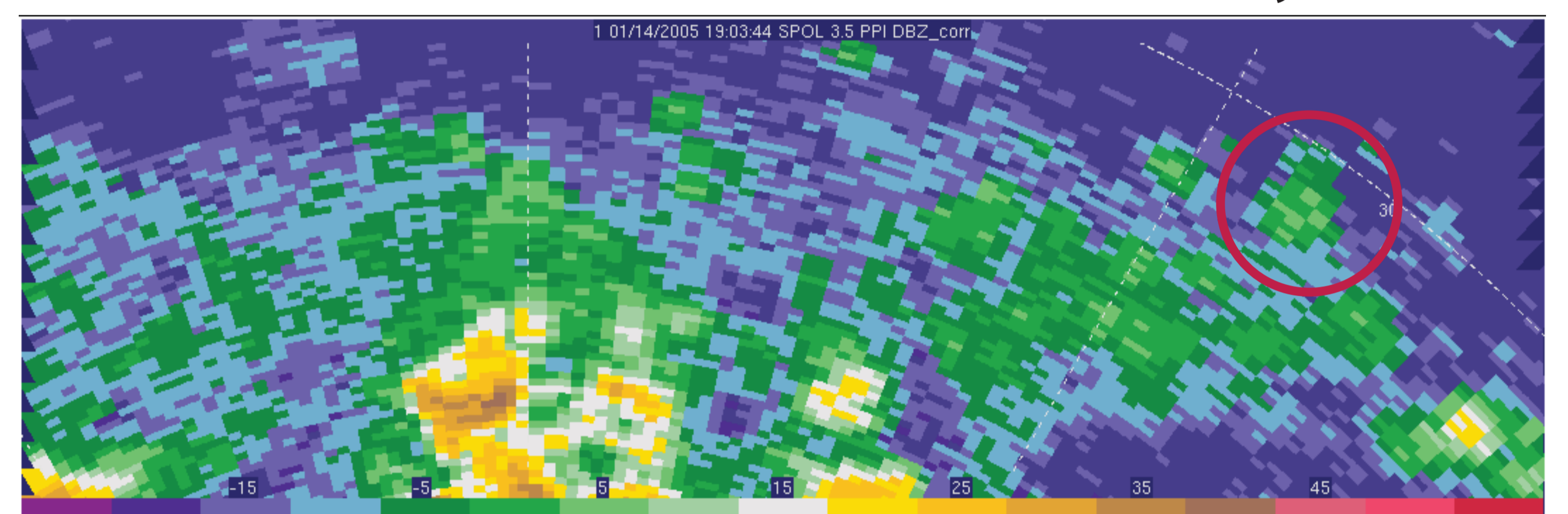
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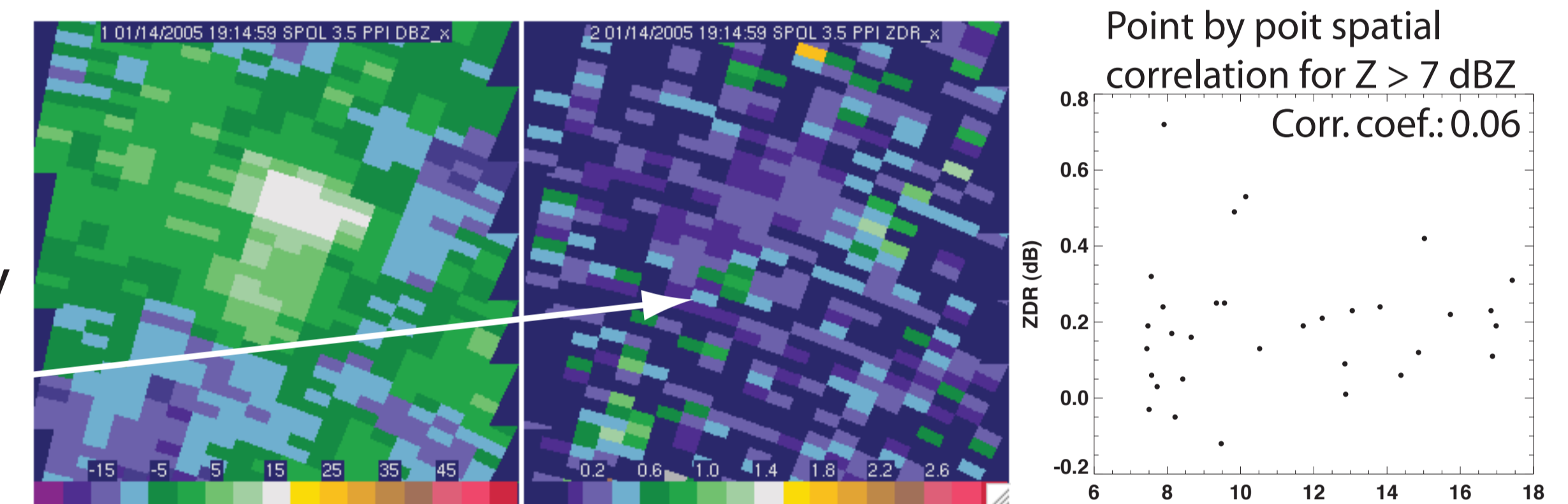
Pictures courtesy Harry Ochs, Bjorn Stevens



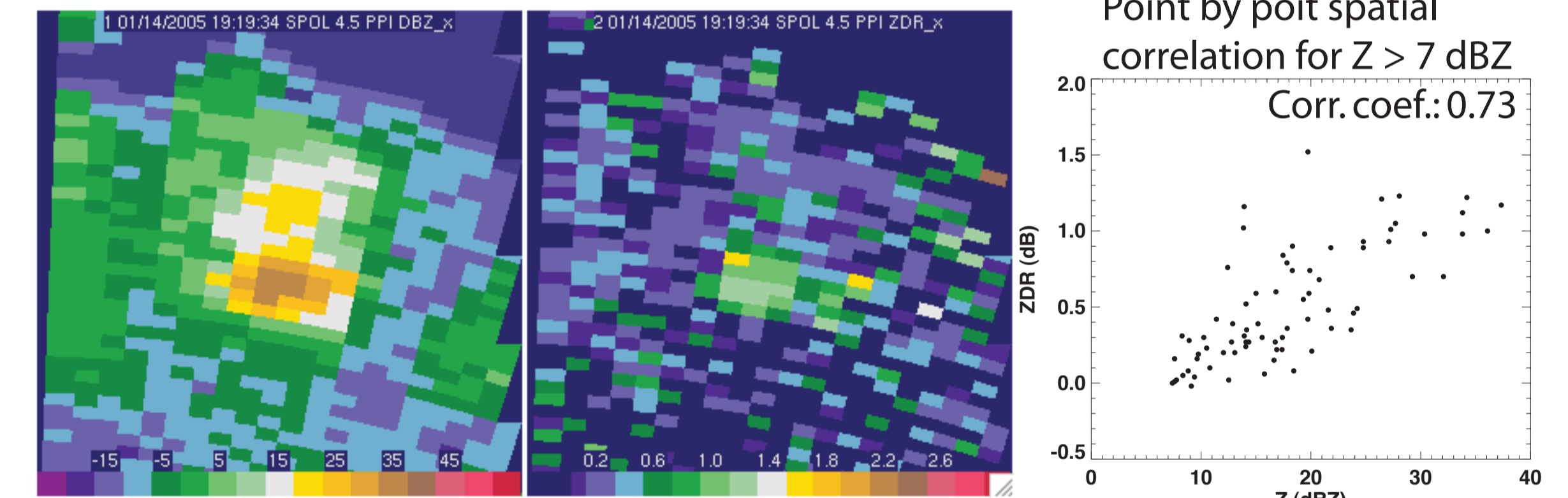
### Cloud evolution in S-band radar reflectivity:



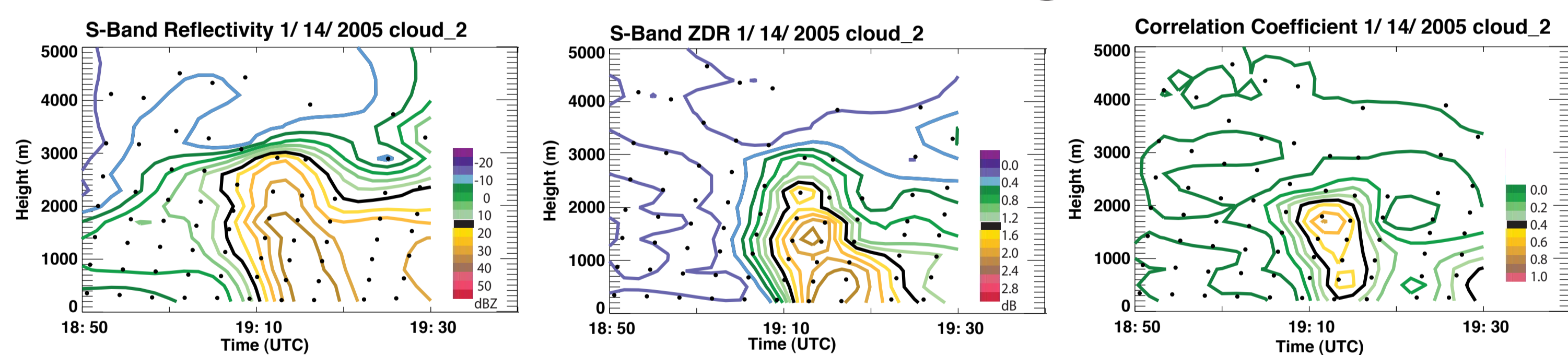
Drop sorting early in the evolution of the cloud



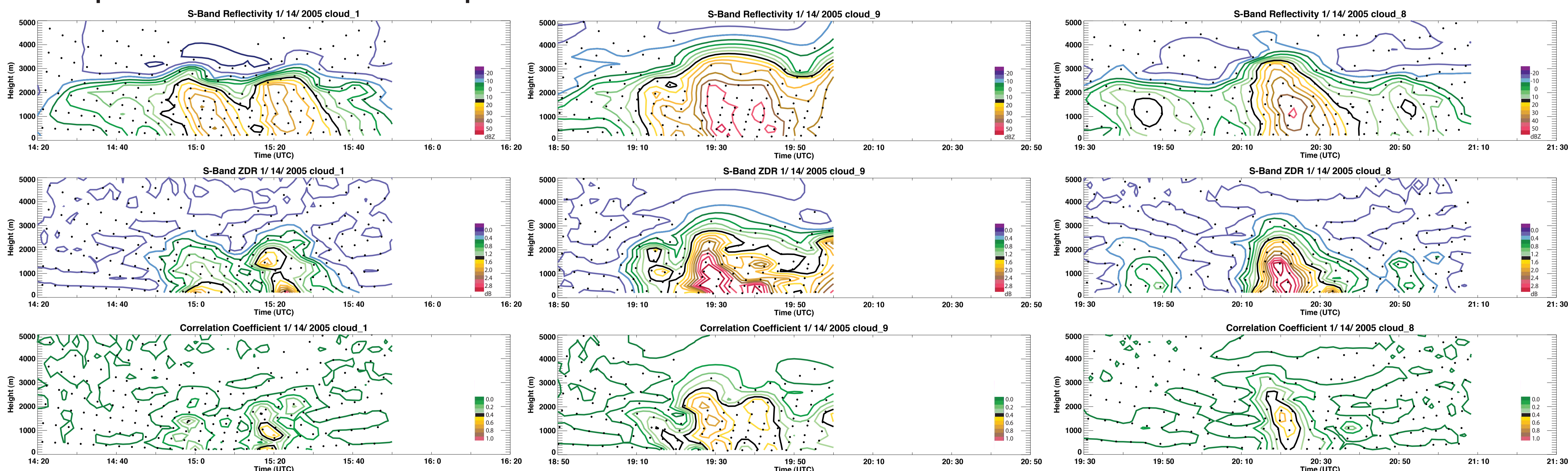
Development of a mature rainshaft (max Z and max Z<sub>DR</sub> aligned) later in the evolution of the cloud



### Example of a cloud with a single shaft:



### Example of clouds with multiple shafts:



### Concluding Remarks

- ☁ Clouds showing pulsating updrafts are common during certain days in RICO. Towers emerge from a cloud that has a long lifetime.
- ☁ The spatial correlation between Z and ZDR follows in time and altitude with the maximum ZDR in the clouds, slightly ahead of maximum Z.
- ☁ Soon after the clouds reach their maximum Z, Z and ZDR de-correlate spatially.

### Implications

- ☁ Largest raindrops form and fall early in the lifetime of the rainshaft.
- ☁ The microphysical evolution of the clouds are complicated by pulsed updraft structure ("time zero" not obvious).