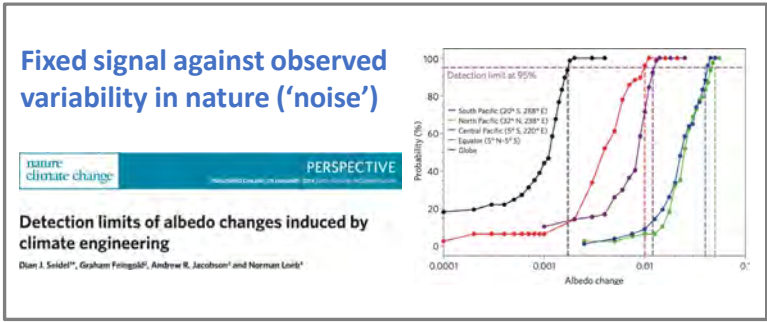
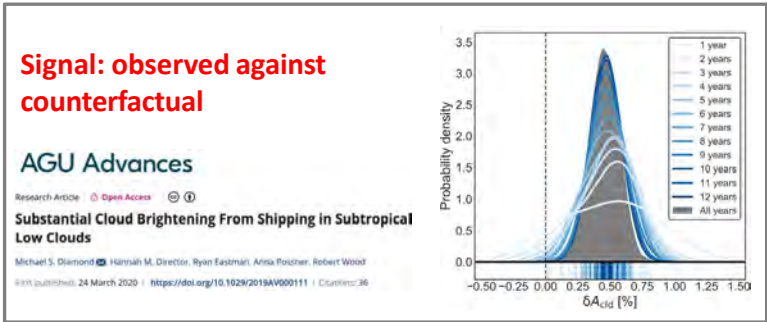


“Detectability is a signal-to-noise ratio problem”

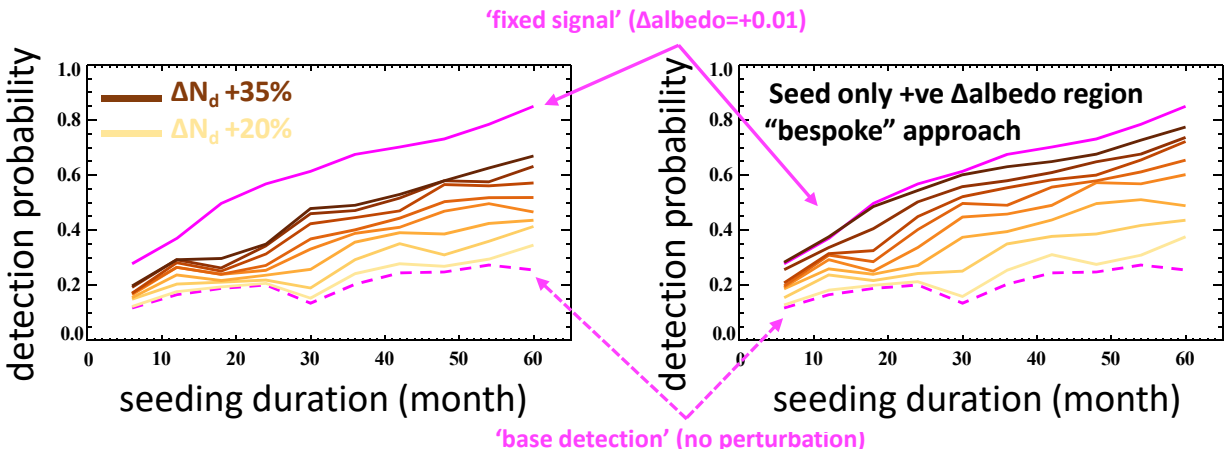
MCB detectability

Cloud organization and S<sub>0</sub>

Previous work



This work: Meteorology-dependent ‘signal’ based on a Machine Learning model; Natural variability as ‘noise’ from satellite observations



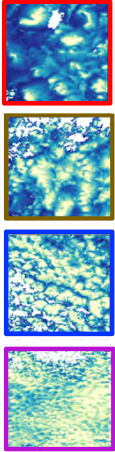
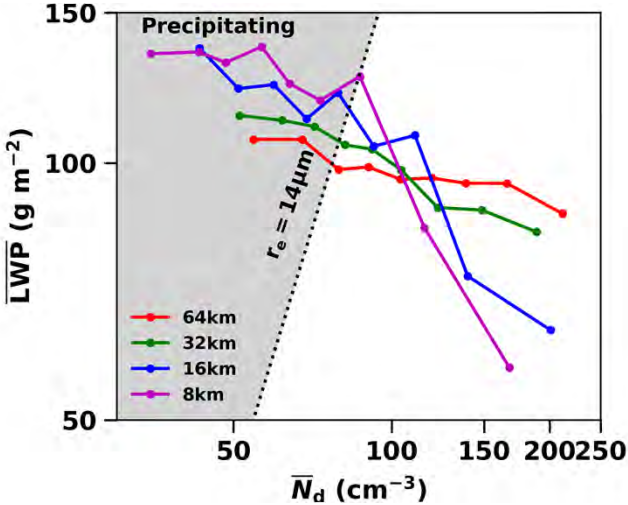
**Key Results**

- A meteorology-dependent and temporally evolving, ‘signal’ is only weakly detectable.
- A ‘bespoke’ approach could help but it scales with seeding efforts.
- A robust metric for detectability is needed.

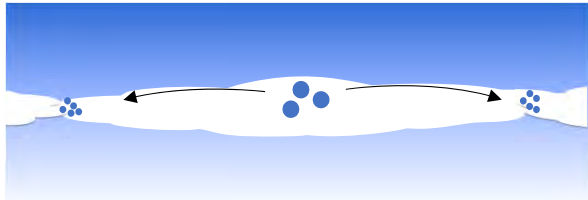
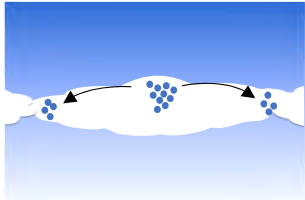
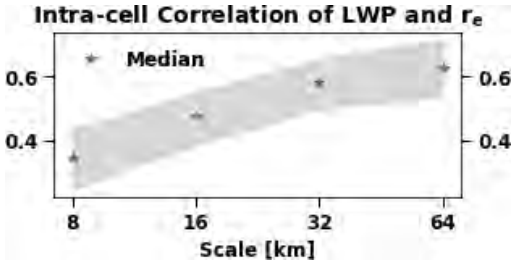
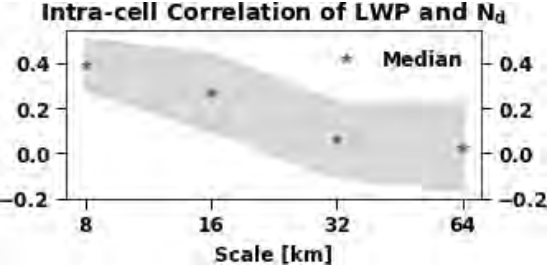
MODIS/CERES over ENA, 7 years data

MCB detectability Cloud organization and  $S_0$

### LWP adjustment is sensitive to cell size



64km  
32km  
16km  
8km



### Key Results

- Mesoscale cellular convection (MCC) cell-size significantly regulates aerosol-induced cloud albedo via its effect on cloud water adjustment.
- Notable intra-cell co-variability between LWP and  $N_d$  within MCCs that varies with cell size. Erroneously considering such co-variability as a LWP response to  $N_d$  can lead to a significant positive bias, especially for small scale MCCs.

