A more general paradigm for understanding the decoupling of stratocumulus-topped boundary layers (STBL): the importance of horizontal temperature advection
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• **Motivation:** previous studies on STBL decoupling are limited to subtropical oceans with cold air advection.

• **Data:** > 700 STBL cases are collected from ENA, MAGIC, and MARCUS.

• **Result:** Stronger decoupling in a deeper STBL:
  Not new

• **Result:** For a given $z_i$, stronger decoupling in smaller $T_{adv}$:
  New

Zheng and Li, 2019, JGR

Cold-air outbreaks

Previous studies over subtropics

Zheng et al., 2020, accepted, GRL
A schematic diagram

Zheng et al., 2020, accepted, GRL
Future work and potential collaboration

• We are running large-eddy simulations to elucidate the physics

• We plan to use COMBLE data to further test this finding

• Influence of decoupling on the aerosol-cloud interactions