Effect of improvements in GCM boundary layer and cloud physics

(a) CALIPSO-GOCCP

90° N

60° N

30° N

30° S

60° S

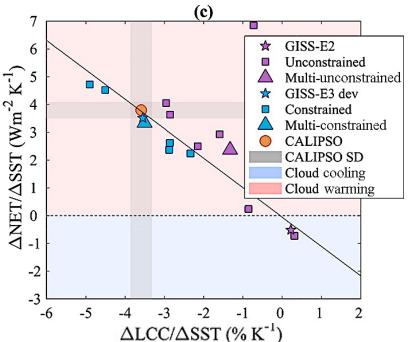
90° S

180° W 120° W

0

EQ

Stratocumulus decks now visible off west coasts of continents in GISS ModelE3; mostly non-existent in ModelE2



90° W 120° W 60° E 120° E 180°] 180° 60° 60° W 120° E 180° E (d) GISS-E2 90° N 60° N 30° 10 20 30 40 50 60 70 80 90 LCC (%) EO 30° S (low cloud cover) 60° S 90° S 180° W 120° W 60° W 60° E 120° E 180° 0 Sensitivity of net cloud radiative effect in subsidence regions to interannual SST changes now matches CALIPSO retrieval; implies positive low cloud feedback

90° N

60° N

EO

30° S

60° S

30°

(b) GISS-E3

Cesana, Del Genio, Ackerman, Kelley, Elsaesser, Fridlind, Cheng, and Yao, 2019: Evaluating models' response of tropical low clouds to SST forcings using CALIPSO observations. *Atmos. Chem. Phys.*, 19, 2813-2832