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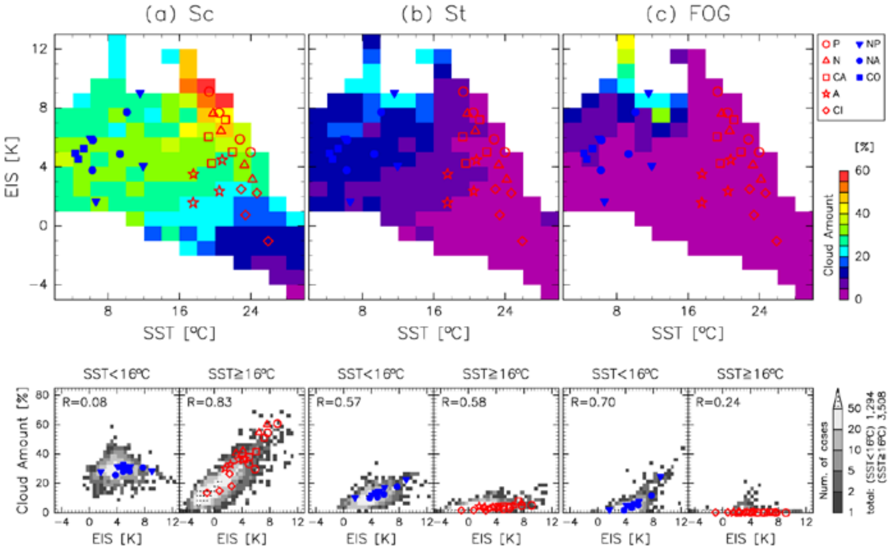

Figure 1. (top) Mean (a) Sc, (b) St, and (c) FOG amounts for SST and EIS intervals and (bottom) frequency of occurrence for EIS and (a) Sc, (b) St, and (c) FOG amount intervals in the warm SST regime (SST ≥ 16°C) and the cold SST regime (SST < 16°C), for all 5° × 5° seasonal climatologies over the ocean between 60°N and 60°S. Markers represent a scatter plot seasonally averaged for LSC regions defined by Klein and Hartmann (1993); red open and blue filled markers correspond to those in the subtropical and midlatitude oceans, respectively.

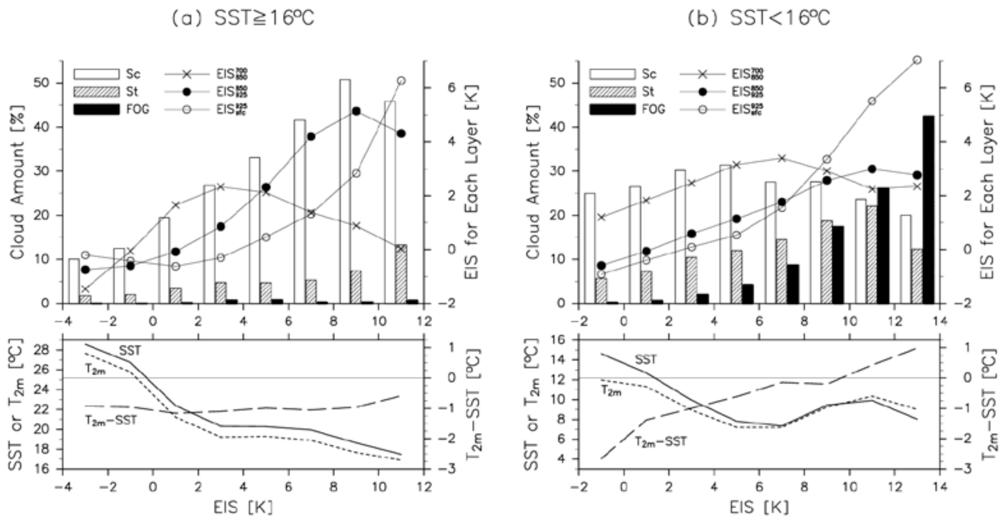

Figure 2. (top) LSC-type amounts and EISs for three divided layers in the lower troposphere averaged into intervals of EIS in the (a) warm and (b) cold SST regimes. (bottom) SST (solid), 2-m temperature (dotted), and air–sea temperature difference (dashed) averaged into intervals of EIS in the (a) warm and (b) cold SST regimes.

- Low stratiform clouds (LSCs) are of three types: stratocumulus (Sc), stratus (St), and sky-obscuring fog (FOG). Using a long-term ship-based cloud report archive, this paper demonstrates relationships between the amount of each LSC type and the estimated inversion strength (EIS) over the global ocean.
- The relationships are clearly divided into two regimes at a sea surface temperature (SST) of approximately 16°C: Sc is the only dominant type and its amount is strongly correlated with EIS in the warm SST regime, whereas the St and FOG amounts increase with EIS in the cold SST regime.
- Examination of vertical layers contributing to EIS reveals that an increase in the inferred inversion strength between 850- and 925-hPa levels corresponds to that in the Sc amount in the warm SST regime. In the cold SST regime, as EIS increases, relatively high values of inferred inversion strength between 700- and 850-hPa levels change to a rapid increase in that between 925-hPa level and the surface, which coincides with the transition from Sc to FOG. Temperature advection implied by the air–sea temperature difference provides favorable conditions to the variations in the two regimes: general occurrence of cold advection in the warm SST regime and cold-to-warm transition of advection in the cold SST regime.