Mean SST bias and variability at inter-annual and decadal time-scales in CMIP5 models

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Analysis of model systematic errors in Sea Surface Temperature (SST) has generally focused on local processes
and particular basins. Mean warm bias over the south subtropical upwelling systems in coupled models are largely
studied and local cloud cover, alongshore winds and ocean stratification are pointed out as the responsible pro-
cesses. Mean errors have impacts on the variability but this is less understood. In this study we try to understand
the relation between mean global SST biases and how models perform the variability at different time-scales. To
this end, we calculate the SST variability modes for 18 models in the preindustrial control CMIP5 experiment. We
first analyse the seasonality of those modes and the inter-model differences. Associated parameters are confronted
with the mean SST bias variability among models, thus we conclude how realistic models simulate the variability
depending on the mean SST bias. Preliminary results suggest that models with cooler (warmer) that average SST
mean bias over the southern hemisphere reproduce better (worse) the Inter-Decadal Pacific variability. Similar
mean bias pattern has an effect on the skill for reproducing Pacific El Nino and Atlantic Nino modes. Finally an
inter-model SST bias variability mode is found relating errors over the southern upwelling systems with cloud
cover around 60S and equatorial precipitation shift. This mode is able to summarize some features in relation with
inter-decadal to inter-annual variability in CMIP5 models and thus represents a potential tool to understand the
wider picture in relation to SST biases and future projections.