

Forecast models struggle to simulate tropical variability and its downstream impacts. Some of this is due to limits on predictability of, for instance, the MJO. However, other causes of poor representation of subseasonal-to-seasonal phenomena are model error and biases, and diagnosing how these errors and biases are associated with different dynamical processes is crucial for improving model representations of subseasonal phenomena. Here, we introduce a dynamical filter of tropical variability based on a linear inverse model (LIM). In contrast to variance-based or bandpass filters, our filter can isolate specific modes of tropical variability that are relevant for sub-seasonal forecasting. In particular, we apply our filter to both reanalysis data and model output from the Integrated Forecasting System (IFS) to assess how well the latter can represent modes of variability such as the MJO and ENSO. This is the first step towards our eventual goal of diagnosing how these errors impact extratropical anomalies that evolve and propagate downstream to degrade CONUS forecast skill of temperature and precipitation.