Decadal variability of the East Asian summer jet and its relationship to sea surface temperatures

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Variability of the East Asian summer jet stream (EAJ) has a significant impact on the climate of East Asia, primarily through its modulation of East Asian precipitation. In recent decades the impact of sea surface temperatures (SSTs) in the tropical Indian and Pacific oceans on the EAJ have been studied in considerable detail, however much less is known about the drivers of EAJ variability on decadal or multi-decadal timescales. Investigating this problem is made more challenging by the temporal limitations of reanalysis datasets.

In order to establish whether SSTs can provide a source of skill in predicting decadal variations of the EAJ, we analyse long pre-industrial control runs of the CMIP6 models. One issue with studying coupled model runs is that it is often unclear whether particular SST anomalies are forcing the atmosphere, and thus can provide a meaningful source of skill, or whether they are merely responding to local atmospheric anomalies. We address this issue by combining SST and turbulent heat flux information to indicate the direction of the forcing.