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Predictability of climate system: a linear stochastic model-based analysis

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The predictability of climate system is studied using linear stochastic models, where predictable component comes from oceanic processes and air-sea interaction while unpredictable component is from weather noise. The relative strength of the two components, which measures the predictability, is largely determined by the spatial structure of the deterministic dynamics and the stochastic forcing. In general, a non-normal system could possess high predictability than the corresponding normal system, and its most predictable patterns may resemble neither normal mode nor EOF. Then as case studies, the predictability of mid-latitude SST anomaly and tropical Atlantic variability are analyzed with the framework of linear stochastic modeling.