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Relationship between Thermodynamic Anomalies in Arabian Sea–Bay of Bangle on Rainy-season Precipitation in Yunnan

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This study examines how the thermodynamic anomaly in Arabian Sea (AS)–Bay of Bangle (BOB) relates to Yunnan precipitation in the rainy season. The observational diagnosis basing on data sets of atmospheric circulation reanalysis, precipitation from 124 stations in Yunnan and outgoing longwave radiation indicates that, when the thermodynamic anomaly in the AS–BOB is weaker during rainy-season, an anomalous anticyclone will control the AS–BOB. An anomalous cyclone in Yunnan resulted from the anomalous anticyclone in the AS–BOB induces anomalous water vapor converging with anomalous cold air in the same region. As a result, heavier-than-normal precipitation occurs in Yunnan in rainy-season. When the thermodynamic anomaly in the AS–BOB is stronger, the opposite configuration of anomalous circulation will cause less-than-normal precipitation in Yunnan. The results of several numerical experiments obtained from a linear baroclinic model support the key physical processes revealed in the observational diagnosis.