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Title: Role of Atmospheric Wind Forcing in the Second-year Cooling
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Abstract:
An intermediate coupled model (ICM) was demonstrated to make a successful real-time forecast of sea surface temperature (SST) evolution during 2011 while some other coupled models failed. Previously, subsurface thermal anomaly effects are identified to be an important factor affecting the second-year cooling in mid-late 2011, as explicitly parameterized by the relationships between oceanic entrainment temperature (Te) and sea level (SL) in the ICM. Since atmospheric wind forcing is also important to ENSO dynamics, in this study, the ICM-based experiments are performed to investigate the roles these two factors play in the second-year cooling of the 2010-12 La Niña event. It is illustrated that interannual wind forcing effects are equally important to the SST evolution during 2010-11 in association with the Te effect. An easterly wind anomaly was observed to persist over the west-central Pacific during 2010-11, which acted to sustain a horse shoe-like Te pattern connecting large negative subsurface thermal anomalies on and off the equator. The second-year cooling in 2011 is not predicted to occur in the ICM if the easterly wind anomaly intensity is weakly represented below certain levels.
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