

# Strong Eastern Pacific El Niños dominate amplitude variations and asymmetry in observations and climate models

*Freitag, 12. April 2024 09:20 (20 Minuten)*

The amplitude of El Niño/Southern Oscillation (ENSO) varied considerably over the last 140 years. We find that the difference between high and low ENSO-amplitude periods results mainly from the number of strong Eastern Pacific (EP) El Niños, while Central Pacific (CP) El Niños and La Niña events do not contribute much. Further, the asymmetry of ENSO, i.e. SST anomalies during El Niño being stronger and located further to the east than during La Niña events, is closely linked to ENSO amplitude as well as the number of strong EP El Niño events in observations.

We find similar relations in the 40 historical runs of the Large Ensemble with CESM1 that simulates the ENSO asymmetry realistically. Further, there is a strong relation between the ENSO amplitude and the tropical Pacific mean state, indicating that a warmer eastern equatorial Pacific favors more EP El Niños due to a lower convective threshold in that area.

Consistent with these findings, CMP6 models that suffer from a strong cold tongue bias underestimate the fraction of strong EP El Niños with implications for their representation of ENSO asymmetry.

**Hauptautoren:** LÜBBECKE, Joke (GEOMAR); BAYR, Tobias

**Co-Autor:** LATIF, Mojib

**Vortragende(r):** LÜBBECKE, Joke (GEOMAR)

**Sitzung Einordnung:** Conference