Generation mechanisms of the Benguela Nino with a focus on local amplification

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Benguela Nino is associated with positive sea surface temperature (SST) anomalies off the west coast of Angola and Namibia in the South Atlantic. Although both local and remote forcing have been indicated to contribute to the development of Benguela Nino, the reason why their relative contribution varies among the events has not been clarified. Thus, the generation mechanisms of the Benguela Nino are investigated in this study by categorizing the events into locally amplified and non-locally amplified events depending on whether alongshore wind anomalies contribute to the development of the Benguela Nino. It is found that the locally events are associated with alongshore northerly wind anomalies related to anomalous weakening of the subtropical anticyclone in the South Atlantic known as St. Helena High and the continental low named Angola Low. On other hands, no alongshore wind anomalies that favor the development of SST anomalies exist in the non-locally amplified events. A mixed layer heat budget analysis reveals that the surface heat flux term is greater in the locally amplified events owing to smaller latent heat release associated with the weakening of the climatological southerly winds, while the anomalous warming by the advection term is stronger in the non-locally amplified events.

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