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Oral
From December 2019 onward there was an increase in equatorial Atlantic sea-surface temperatures (SST), with anomalous warming in the eastern part of the basin. While such interannual warm events (also known as Atlantic Niños) are a common occurrence in the region, the 2019/2020 event stands out for two reasons: 1) Even after accounting for the warming trend, it is the warmest event in at least two decades, thereby puncturing a period of relatively low variability in the equatorial Atlantic. 2) Its timing was unusual, as Atlantic Niños almost tend to develop in boreal spring and peak in summer.
Here we analyze observations (including ePIRATA), ocean reanalyses, and the OFES2 ocean hindcast to explain the unusual development of the 2019/2020 event. The results suggest that equatorial westerly wind anomalies and the accompanying upwelling anomalies did contribute to the warming, but were not strong enough to account for its magnitude. More striking were the pronounced westerly wind anomalies north of the equator. The resultant meridional shear and wind stress curl led to downwelling off-equatorial Rossby waves that were reflected into downwelling equatorial Kelvin waves at the western boundary. The relative importance of these processes, however, remains somewhat uncertain, as reanalyses show some disagreement, with some products missing the event altogether. This highlights the need for in-situ observations and improved reanalysis products for the tropical Atlantic.
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