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An oceanographic and meteorological buoy, dedicated to monitoring and analysis of the natural variability and anthropogenic change of the Senegalese coastal upwelling, was deployed early 2015. We present a closed heat budget analysis of the sea surface temperature variations, over 2016-2017, year of an exceptional ENSO. Our observational study evidences paradoxical results regarding the cooling processes during part of the six-month upwelling season. Latent heat loss by intrusions of dry air seasonally takes over the wind-stress driven upwelling dynamics. The latter instead even warms the surface due to intrusion of subsurface waters with temperature inversions. Results are supported by a numerical study, and challenge our canonical conception of coastal upwelling functioning.
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