Geophysical Research Abstracts
Vol. 16, EGU2014-10582-1, 2014
EGU General Assembly 2014
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Forcing mechanisms of intraseasonal SST variability off central Peru in 2000-2008

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The Sea Surface Temperature (SST) intraseasonal variability ([40-90] days) along the coast of Peru is commonly attributed to the efficient oceanic connection with the equatorial variability. Here, we investigate the respective roles of local and remote equatorial forcing on the intraseasonal SST variability off central Peru (8°S-16°) during the 2000-2008 period, based on the experimentation with a regional ocean model. We conduct model experiments with different open lateral boundary conditions and/or surface atmospheric forcing (i.e. climatological or not). Despite evidence of clear propagations of coastal trapped waves of equatorial origin and the comparable marked seasonal cycle in intraseasonal Kelvin wave and coastal SST variability (i.e. peak in Austral summer), this remote equatorial forcing only accounts for $\sim$20% of the intraseasonal SST regime, which instead is mainly forced by the local winds and heat-fluxes. A heat budget analysis further reveals that during the Austral summer, despite the weak along-shore upwelling (downwelling) favourable wind stress anomalies, significant cool (warm) SST anomalies along the coast are to a large extent driven by Ekman-induced advection. This is shown to be due to the shallow mixed layer that increases the efficiency by which wind stress anomalies relates to SST through advection. Diabatic processes also contribute to the SST intraseasonal regime, which tends to shorten the lag between peak SST and wind stress anomalies compared to what is predicted from an advective mixed-layer model.