



Advective transport caused by intra-seasonal Rossby-waves : a key player of the high variability region off the Peru upwelling region.

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The upwelling region off Peru between 5°S and 12°S is characterized by high intra-annual variability offshore due to sea-surface chlorophyll anomalies propagating westward. Auto-spectral and cross-spectral analyses of SSH, SST and chlorophyll satellite data show that these events are generated by intra-seasonal Rossby waves. Offshore of Peru, Rossby waves are found to produce chlorophyll fluctuations whose magnitude can reach half the variance of total chlorophyll. The almost constant phase shift between chlorophyll and altimetric signals – chlorophyll leads SSH by about $2\pi/3$ – suggests a physical advective mechanism. This assumption is tested using a simple conceptual model, which confirms that mostly horizontal, and to a lesser extent, vertical advective processes are dominating. Furthermore, changes in the temporal and spatial frequencies and in the phase velocities suggest a transition from a second to a first mode for the dominant Rossby waves from the North to the South. The latitude, at which this switch occurs, is in agreement with the critical latitudes theory.