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Assessment of OSCAT winds for coastal circulation on the north western continental shelf of India

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Abstract. Winds and tides are the major driving forces of the circulation in the coastal and marginal seas. Data Interpolating Variation Analysis (DIVA) method is used to generate spatial and time series data of sea surface winds for the period 2010–2013 at daily time scale from the OSCAT observations. Validity and consistency of the data were examined against the in situ observations and ECMWF re-analysis at different time scales. Amplitude of semi-annual cycle of OSCAT winds in the coastal domain is 30 % larger than the ECMWF winds while the amplitude of annual cycle of OSCAT winds is 20 % smaller than the ECMWF winds. On the open oceans, intensity of respective semi-annual cycles are mostly similar while annual cycle of OSCAT wind is 20 % smaller than the ECMWF winds. Wind driven currents over the western continental shelf of India were simulated by forcing OSCAT and ECMWF winds to a coastal circulation model. It is observed that the mean seasonal circulations from both the simulations are identical spatial pattern however the magnitude of simulated currents based on OSCAT winds are much stronger than ECMWF wind forcing. These currents used in a lagrangian tracer transport code to model the oil-spill events occurred in this region. It revealed that OSCAT based ocean currents has performed better in simulating the trajectory than the ECMWF wind driven currents.

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