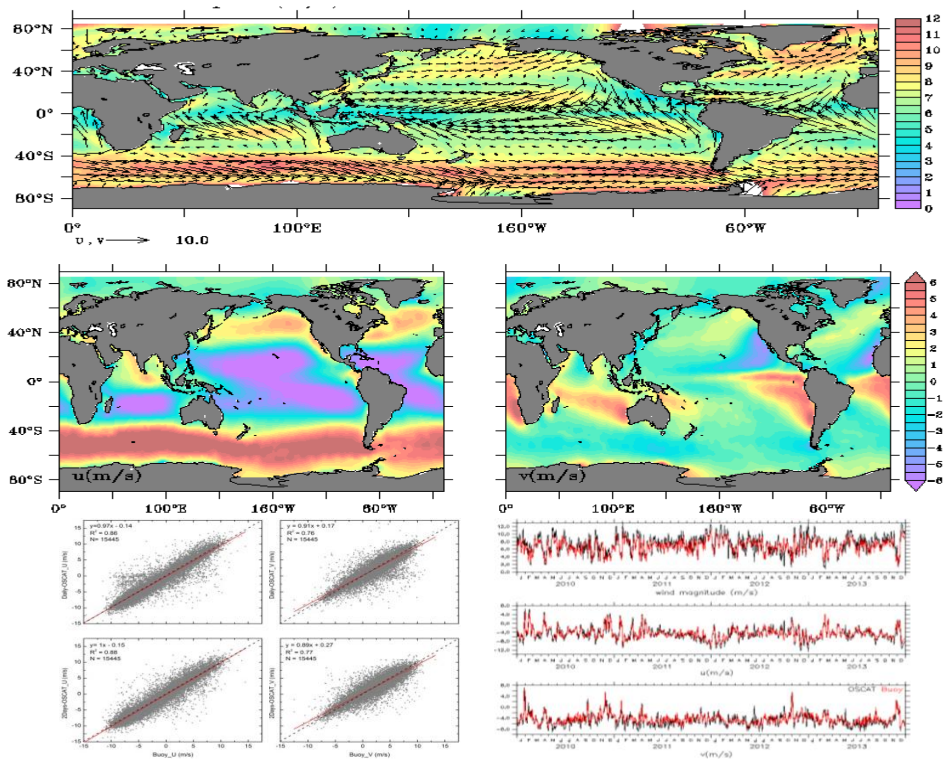
INDIAN SPACE RESEARCH ORGANISATION

Oceansat-2 Scatterometer daily and two-day composite global surface wind fields: Generation and Evaluation

Version 1.0



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Earth and Climate Science Area
NATIONAL REMOTE SENSING CENTRE
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Abstract: Global gridded daily and two-day composite wind fields of Oceansat-2 scatterometer (OSCAT) are generated using variational analysis. For this, ascending and descending pass data of OSCAT version 1.4 have been used. Since OSCAT is currently not in operation, this exercise is carried out to provide good quality data for the entire operational period of OSCAT (2010 – 2013) and can serve as a precursor for future scatterometer missions of ISRO. The gridded daily and two-day composite data is validated using *in situ* buoys over the global oceans and also Advanced Scatterometer (ASCAT). Comparison with buoys is carried out under different scenarios, namely location as well as wind speed ranges. This exercise revealed that the gridded data is of good quality particularly, in the case of two-day composite. Best match is found for wind speed ranging between 3 – 10 ms^{-1}. Inter-comparison with ASCAT has shown that the OSCAT gridded product compares well in both annual and seasonal time scales. The bias and root mean square difference (RMSD) are much less for two-day composite in comparison to daily data. Based on the validation results, it is inferred that OSCAT two-day composite data is better than daily composites and can be used for operational as well as research purposes.

Key words: *Variational analysis, OSCAT, buoys, ASCAT, validation*

Oceansat-2 Scatterometer daily and two-day composite global surface wind fields: Generation and Evaluation

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Contents

OSCAT global wind composites

Abstract

Global gridded daily and two-day composite wind fields of Oceansat-2 scatterometer (OSCAT) are generated using variational analysis. For this, ascending and descending pass data of OSCAT version 1.4 have been used. Since OSCAT is currently not in operation, this exercise is carried out to provide good quality data for the entire operational period of OSCAT (2010 – 2013) and can serve as a precursor for future scatterometer missions of ISRO. The gridded daily and two-day composite data is validated using *in situ* buoys over the global oceans and also Advanced Scatterometer (ASCAT). Comparison with buoys is carried out under different scenarios, namely location as well as wind speed ranges. This exercise revealed that the gridded data is of good quality particularly, in the case of two-day composite. Best match is found for wind speed ranging between 3 – 10 ms^{-1}. Inter-comparison with ASCAT has shown that the OSCAT gridded product compares well in both annual and seasonal time scales. The bias and root mean square difference (RMSD) are much less for two-day composite in comparison to daily data. Based on the validation results, it is inferred that OSCAT two-day composite data is better than daily composites and can be used for operational as well as research purposes.

Key words: Variational analysis, OSCAT, buoys, ASCAT, validation

1 Introduction

Surface winds over global oceans drive heat and momentum transfer between the ocean and atmosphere, thereby forcing the surface circulation of the oceans. Sea surface wind is one of the main input for the operational oceanography as well as climate studies in terms of improving the weather forecasting using numerical weather prediction models (Bentamy and Fillon, 2012; Mathew et al. 2012). Over a period of time, with the improvement in sensor technology, surface winds over the oceans are being measured by employing different sensors starting from wind anemometers fixed on moored buoys and ships to Radars and space based scatterometers. The scatterometer onboard Oceansat-2 mission (OSCAT) is one such space based sensor which was launched by ISRO in September 2009. The scatterometer was operational till February 2014 providing high quality ocean surface wind speed during the period of its operation (Mathew et al. 2012; Chakraborty et al. 2013; Chakraborty & Raj Kumar 2013; Sudha & Prasadarao 2013 and Jayaram et al. 2014).

In this study, the reprocessed OSCAT global data with modified Geophysical Model Function (GMF) version 1.4 are used to generate gridded zonal (u) and meridional (v) components of wind field vector by combining daily ascending and descending passes using Data-Interpolating Variational Analysis (DIVA) model (Truopin et al. 2010, Jayaram et al. 2014). This method was first tested over the Indian Ocean for the year 2012 as a case study and was found to provide good quality wind product (Jayaram et al. 2014). Therefore, the same methodology was extended to the global oceans over for the entire period of OSCAT data availability between 2010 and 2013. Apart from daily, two day wind composites were also generated so as to evaluate the quality of two day moving average data product vis-a-vis daily wind composites. The details of interpolation methodology are discussed in detail by Jayaram et al. (2013 & 2014). The composite wind vectors generated are validated using *in situ* wind observations from buoys in the Pacific, the Atlantic and the Indian Ocean. Advanced Scatterometer (ASCAT) data for the same period is also used to evaluate the OSCAT gridded daily and two-day wind fields. The purpose of this study is to provide gridded global wind fields from OSCAT with an evaluation of their accuracy.

2. Data and methodology

2.1. Data

2.1.1. Satellite data

OSCAT daily global data of wind speed and direction (Version 1.4) for both ascending and descending passes with a spatial resolution of 50 km x 50 km, is obtained from the Oceansat-2 data portal of National Remote Sensing Centre (NRSC) [www.nrsc.gov.in] for the period 2010 - 2013. OSCAT has a repeat cycle of two-days with the equatorial crossing time of 12 PM ± 10 minutes orbiting at an altitude of 720 km and inclination of 98.25° (Chakraborty and Rajkumar, 2013). Wind speed and direction are converted to *u* and *v* components of the wind vector for this study. Global ASCAT data is obtained from the Asia Pacific Data Research Centre (APDRC) [aprdc.soest.hawaii.edu] for the period 2010 – 2013. ASCAT is one of the sensors onboard METOP-A and B of EUMETSAT. It operates in C-band at 5.3 GHz with six fan beam antennae and two swaths of 550 km wide. The accuracy of ASCAT is 1.3 m s^{-1} and ~18° for wind speed and direction, respectively (Verhoef and Stoffelen, 2009). ASCAT daily wind products are available at 25 km x 25 km spatial resolution and are being generated following the methodology of Bentamy and Fillon (2012). For this study, the ASCAT data is resampled to match the spatial resolution of OSCAT data.

2.1.2. *In situ data*

In situ buoy data is used in this study to ascertain the accuracy of the OSCAT gridded wind fields. This data is obtained from different buoys deployed in the global oceans under various operational programmes like Research Array for African-Asian-Australian Monsoon Analysis and prediction (RAMA), Indian Ocean Observation Services programme of the Ocean Observation Systems – National Institute of Ocean Technology (OOS-NIOT) in the Indian Ocean region, Tropical Atmosphere Ocean (TAO)/Triangle Trans-Ocean (TRITON) buoy network in the Pacific Ocean, and Prediction and Research moored Array in the Tropical Atlantic (PIRATA) in the Atlantic Ocean. Daily data from RAMA, TAO/TRITON and PIRATA buoys for the period 2010 – 2013 is obtained from www.pmel.noaa.gov. The accuracy of buoy data for wind speed and direction are 0.3 ms^{-1} and 2°, respectively (McPhaden et al. 1998). The data pertaining to OOS-NIOT buoys is archived at INCOIS and the accuracy of these buoy winds is 0.3 ms^{-1} and 3° (Venkatesan et al. 2013). The location of these buoys is shown in figure 1. Buoy observations are made at a height of 4 m and 3 m for Pacific Marine Environmental Laboratory (PMEL) and OOS-NIOT data, respectively. Since the scatterometer based wind observations are at 10 m from the sea surface, the buoy data is interpolated to 10 m height following Panofsky and Dutton (1984) and Satheesan et al. (2007).

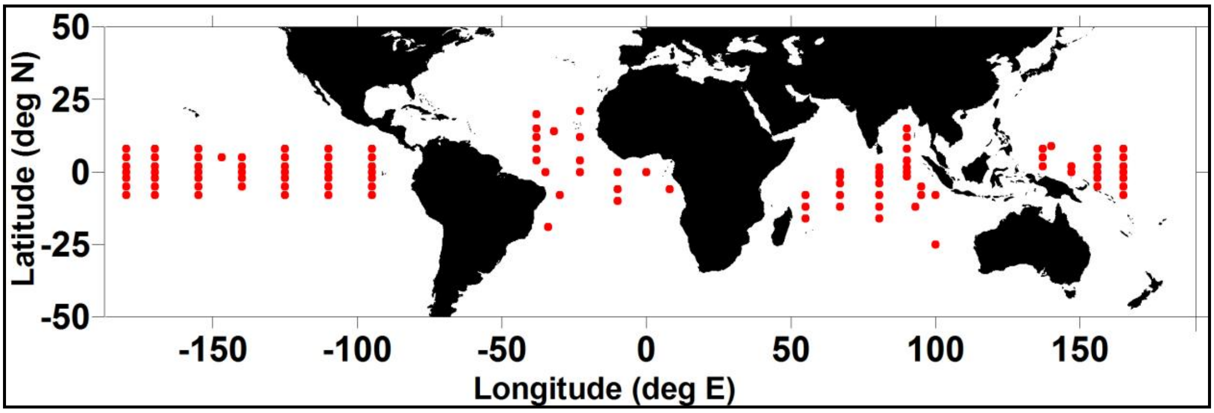

Figure 1: Location of buoys used for in situ validation

2.2. Data-Interpolation Variational Analysis (DIVA)

GeoHydrodynamic and Environmental Research (GHER) under the SeaDataNet project of the European Union had developed DIVA which can be ported easily on any Linux work station (Troupin et al. 2010, Udayabhaskar et al. 2012, Jayaram et al. 2014). DIVA is equipped with automatic coastline detection based on the numerical coast which is independent of the number of observations. Outliers are detected by comparing data residual with the standard deviation (SD) of the resultant data (Troupin et al. 2010). The error component within the output is generated for each grid cell and can be used based on the limits set by the user which is usually less than 0.3. During the study period, 2010 – 2013, data is not available for 16 days and therefore, those days are not used for interpolation. Similarly, while computing the two day moving average, if the data is missing for one of the days, then data for the set of those two days is not generated. Buoy data corresponding to the missing dates is not included in the analysis and vice-versa in the case of missing dates for buoy data, so that the number of points remains same for both the datasets.

3 Results and Discussion

The merged daily composite of wind speed magnitude along with *u* and *v* components is shown in figure 2. From the figure (2a), the trade wind zone in all the oceanic regions is clearly noticed. Major eastern boundary upwelling regions all over the world are clearly depicted in the *v* wind which has higher values in those regions (Figure 2c). Spatial SD of daily and two-day composite is shown in figure 3. From the figure, it is observed that the SD for two-day composite data is relatively less compared to daily composite data; appreciable change is observed particularly in the higher latitudes where the SD values are observed to be large.

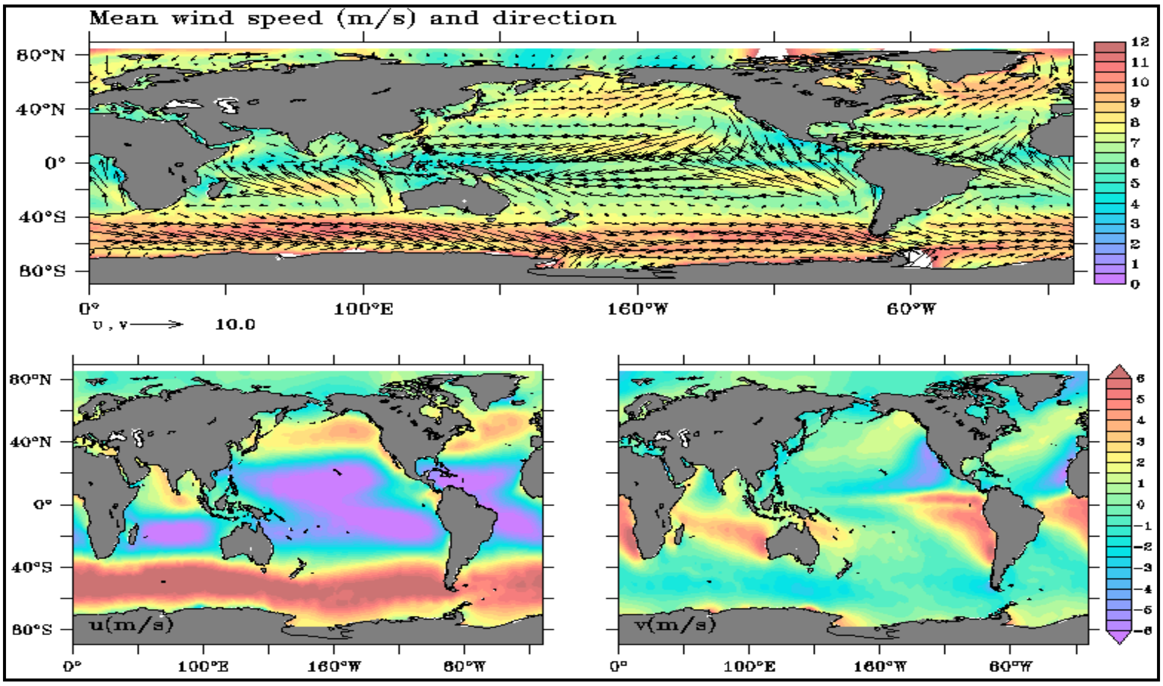

Figure 2: Gridded OSCAT Mean of wind magnitude, zonal (*u*) and meridional (*v*) components of wind speed for the period 2010 – 2013.

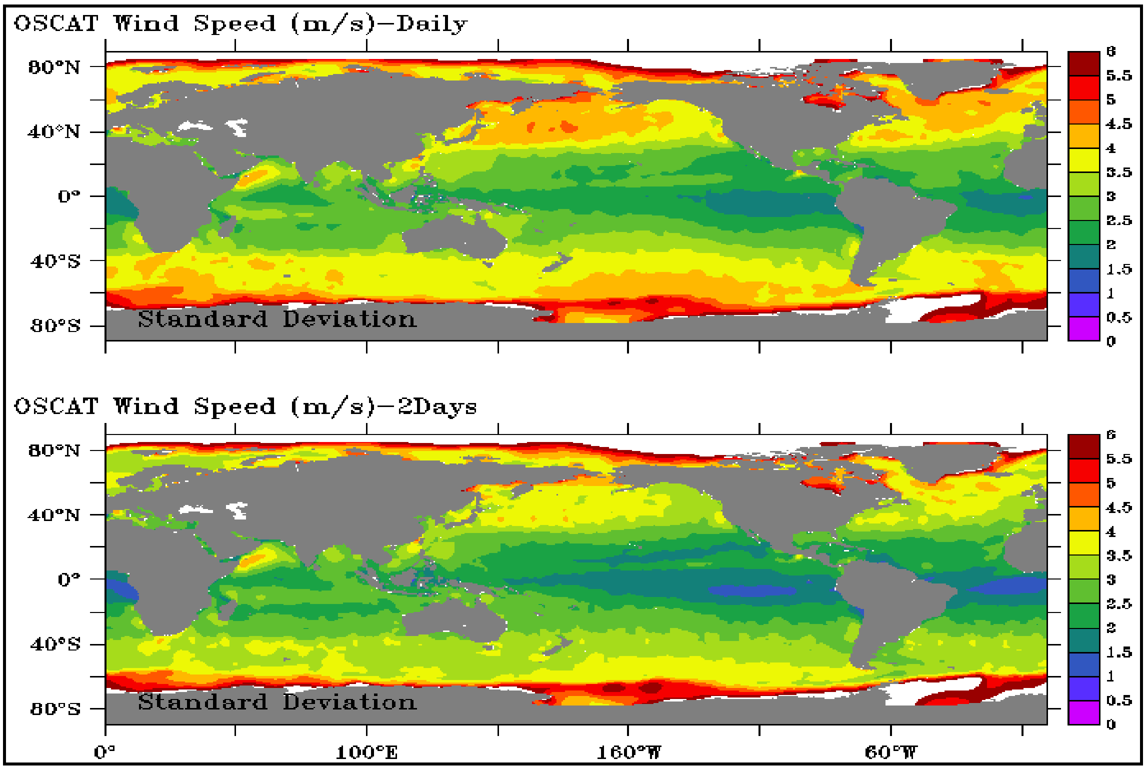

Figure 3: Standard deviation of gridded daily and two-day OSCAT wind speed.

3.1 *In situ* comparison

Data generated using DIVA method is compared with *in situ* observations available over the global oceans. Comparison is carried out for both daily as well as two day composites. Data from nearly 95 buoys is made use of to carry out the analysis. Only those buoys where the data is available for more than one year are considered for the study. Overall, the number of collocated observations for the Indian Ocean is 15445, 19205 for the Atlantic Ocean and 63724 for the Pacific Ocean during the study period. Statistical analysis is carried out separately for each of the oceanic at different wind speed thresholds as well as across the entire spectrum of wind speed values. Figure 4a shows the scatter diagram for the Indian Ocean region. From the figure, it is observed that the interpolated data is matching well with the *in situ* observations with a slight improvement in two day composite data relative to daily data. Figure 4b shows the scatter for the Atlantic Ocean, while figure 4c shows the scatter for the Pacific Ocean. Among the three oceanic basins, the comparison between buoy and interpolated OSCAT data is observed to be better in the Indian Ocean. This could be attributed to the fact that the Indian Ocean being a smaller oceanic basin compared to the Pacific and the Atlantic, the interpolation errors are considerably less. However, it is evident from the Figures 4(a – c) that the interpolated data (either daily or two day composite) matches well with the *in situ* buoy observations. Tables 1 and 2 presents the detailed statistics for the three major oceans for daily and two day composite of OSCAT winds, respectively. In general, the biases between buoy and satellite observations are quite low and do not show any systematic trends.

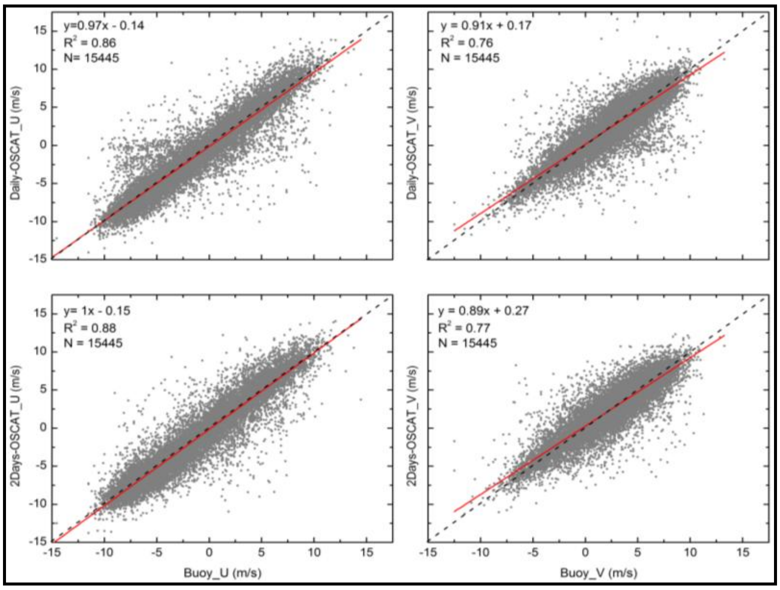

Figure 4a: Scatter diagram between Buoy and OSCAT observations in the Indian Ocean.

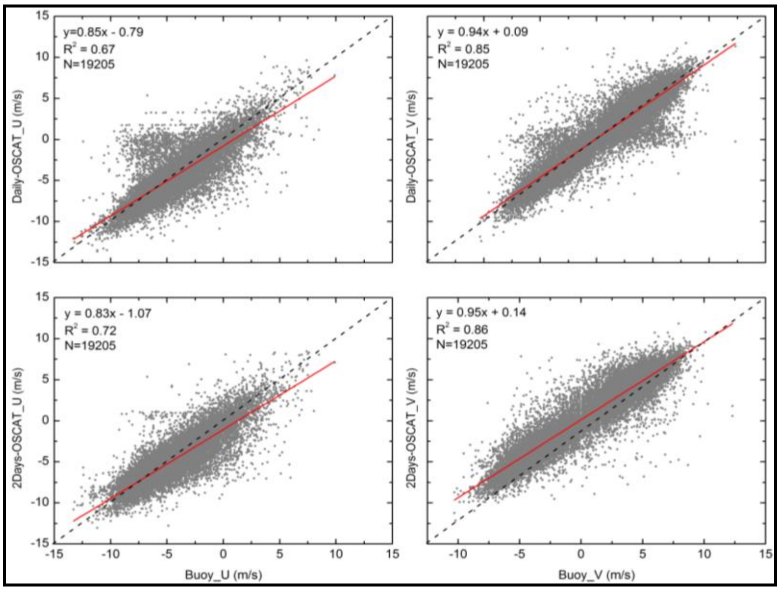

Figure 4b: Scatter diagram between Buoy and OSCAT observations in the Atlantic Ocean.

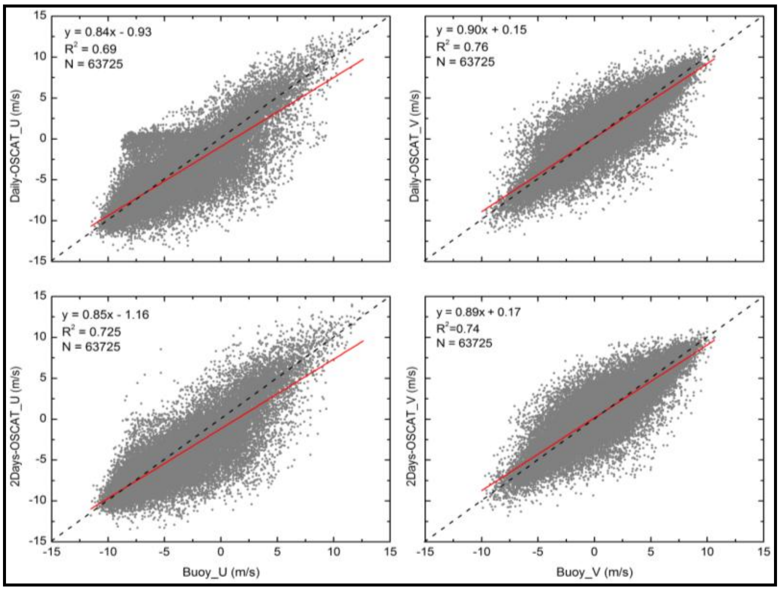

Figure 4c: Scatter diagram between Buoy and OSCAT observations in the Pacific Ocean.

Table 1: Comparison statistics between daily OSCAT composite and *in situ* observations

Daily	**Indian**		**Atlantic**		**Pacific**	
	u (ms^{-1})	**v (ms^{-1})**	**u (ms^{-1})**	**v (ms^{-1})**	**u (ms^{-1})**	**v (ms^{-1})**
Correlation	0.932	0.871	0.819	0.924	0.847	0.901
Bias	0.096	-0.044	0.158	-0.044	0.243	-0.095
RMSD	1.892	1.818	1.766	1.641	2.048	1.654
OSCAT SD	5.200	3.647	2.982	4.244	3.530	3.323
Buoy SD	4.989	3.492	2.863	4.172	3.447	3.205

Table 2: Comparison statistics between two-day composite OSCAT and *in situ* observations

TwoDay	**Indian**		**Atlantic**		**Pacific**	
	u (ms^{-1})	**v (ms^{-1})**	**u (ms^{-1})**	**v (ms^{-1})**	**u (ms^{-1})**	**v (ms^{-1})**
Correlation	0.940	0.879	0.850	0.928	0.839	0.895
Bias	0.154	-0.032	0.370	-0.091	0.510	-0.103
RMSD	1.821	1.741	1.601	1.603	1.958	1.709
OSCAT SD	5.324	3.569	2.825	4.265	3.470	3.307
Buoy SD	4.989	3.492	2.863	4.172	3.447	3.205

From these results, good correlation is observed between OSCAT and in situ observations. From the positive bias value for *u* wind it is understood that the interpolated OSCAT product is underestimated compared to buoy while the negative bias for *v* wind indicates overestimation in case of OSCAT. Root Mean Square Error (RMSD) in all the cases is less than or equal to 2 ms^{-1} which is well within the sensor specifications. Similarly, SD values for both OSCAT and the buoy observations agree well. From these statistical parameters, it is observed that the interpolated OSCAT wind data for both daily and two-day composites is concurrent with the buoy data and is well within the sensor specifications.

In order to further establish the quality of the interpolated gridded OSCAT data products, comparison is made for different wind speed ranges like (a) less than 3 ms^{-1}, (b) 3 – 10 ms^{-1} and (c) above 10 ms^{-1} following Jayaram et al. (2014). Tables 3, 4 and 5 represent the comparison statistics for the Indian, the Atlantic and the Pacific Oceans, respectively.

Table 2: Comparison for different wind speed ranges between buoy observations and OSCAT in the Indian Ocean.

Indian Ocean	**Less than 3 ms^{-1}**		**3 to 10 ms^{-1}**		**Greater than 10 ms^{-1}**	
	Daily	**two-days**	**Daily**	**two-days**	**Daily**	**two-days**
Correlation	0.314	0.563	0.754	0.792	0.211	0.330
Bias	-0.745	-1.504	-0.083	-0.237	0.325	0.091
RMSD	1.602	1.890	1.608	1.428	1.685	1.021
OSCAT SD	1.474	1.382	2.445	2.307	2.436	1.525
Buoy SD	0.696		1.903		0.758	

Table 3: Comparison for different wind speed ranges between buoy observations and OSCAT in the Atlantic Ocean.

Atlantic Ocean	**Less than 3 ms^{-1}**		**3 to 10 ms^{-1}**		**Greater than 10 ms^{-1}**	
	Daily	**two-days**	**Daily**	**two-days**	**Daily**	**two-days**
Correlation	0.109	0.125	0.660	0.745	0.188	0.601
Bias	-1.554	-1.832	-0.023	-0.237	0.361	-4.350
RMSD	2.395	2.537	1.619	1.258	2.313	4.522
OSCAT SD	1.771	1.709	2.144	1.826	2.292	1.541
Buoy SD	0.666		1.580		0.836	

Table 4: Comparison for different wind speed ranges between buoy observations and OSCAT in the Pacific Ocean.

Pacific Ocean	**Less than 3 ms^{-1}**		**3 to 10 ms^{-1}**		**Greater than 10 ms^{-1}**	
	Daily	**two-days**	**Daily**	**two-days**	**Daily**	**two-days**

Correlation	0.132	0.133	0.649	0.715	0.039	0.00
Bias	-1.679	-1.891	-0.041	-0.262	-5.253	-5.221
RMSD	2.514	2.679	1.680	1.422	5.830	5.743
OSCAT SD	1.83	1.858	2.167	1.944	1.570	1.238
Buoy SD	0.705		1.725		2.045	

Statistical analysis within different wind speed thresholds indicate that the best match between buoy observations and the DIVA interpolated OSCAT wind data is between 3 – 10 ms^{-1}. From the correlation values, it is evident that for all the oceans, two-day composite data is in good agreement with *in situ* data across all the wind speed ranges. Negative bias in most cases confirms the overestimation of interpolated OSCAT. RMSD values in 3 – 10 ms^{-1} wind speed range are less for two-day composite than the daily data. The RMSD values are less than 2 ms^{-1}, which is the requirement for gridded wind fields (Bentamy and Fillon, 2012). This is evident for SD as well where the buoy and OSCAT have comparable values. Therefore, it can be concluded that the interpolated OSCAT two-day composite wind data is better, compared to the daily data; and the best match is established for the wind speed range of 3 – 10 m s^{-1}. For most part of the year over the global oceans, winds of this range are prevalent and the gridded product is found to capture that well.

3.1.1. Time series analysis

Despite indicating better match of buoy data and gridded OSCAT data products, there exist slight differences between the two which can be attributed to the local disturbances. Time series assessment is carried out at certain locations in all the three oceans for daily averaged *in situ* data and gridded OSCAT data for both u and v winds. Figures 5, 6 and 7 illustrate the comparison in the Indian, the Atlantic and the Pacific oceans. From the figures, it is noticed that both the data sets follow similar temporal pattern. The comparison in the Indian Ocean (Figure 5) clearly depicts the seasonal variability that is prevalent in the northern Indian Ocean owing to the influence of monsoons. The location in the Atlantic features the lower seasonal variability that is commonly observed in the tropical Atlantic. Similarly, in the Pacific Ocean too, both the buoy and OSCAT data show similar pattern. The time series analysis shows that the gridded OSCAT composite products capture the maximum and minimum wind speed variations occurring in both the hemispheres in all the oceans quite well.

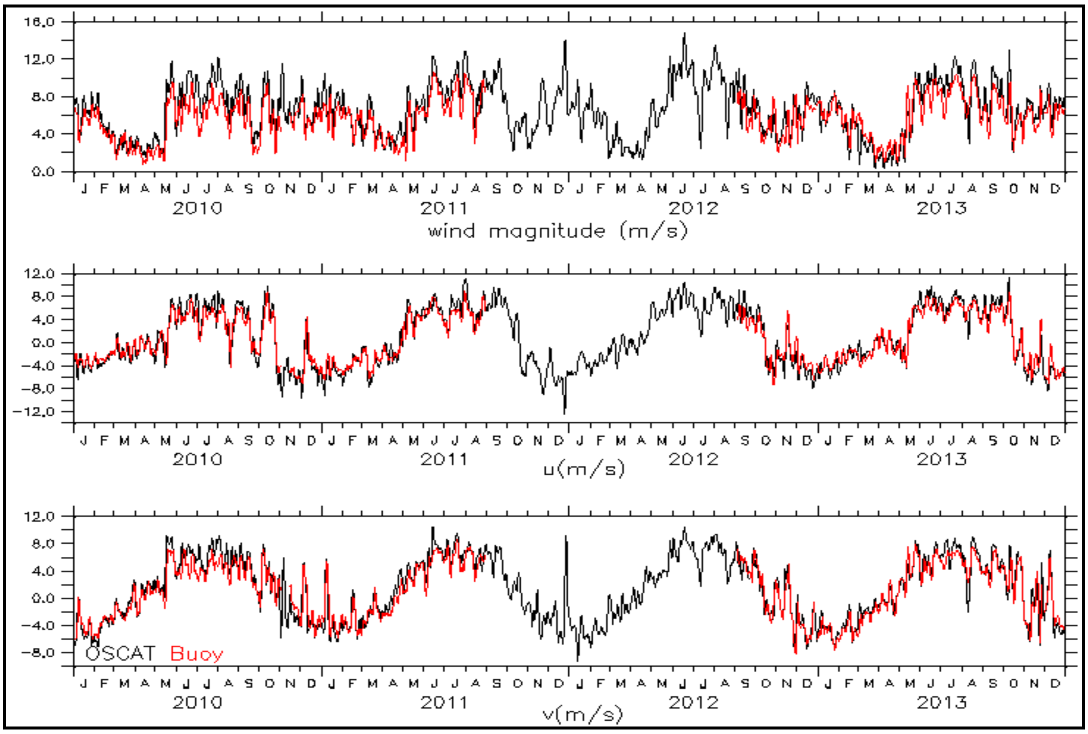

Figure 5: Time series from OSCAT daily and buoy at location 12°N and 90°E in the Indian Ocean. Top panel shows wind speed magnitude, central panel shows *u* component and bottom panel shows *v* component of wind. Red colour indicates buoy and Black shows OSCAT.

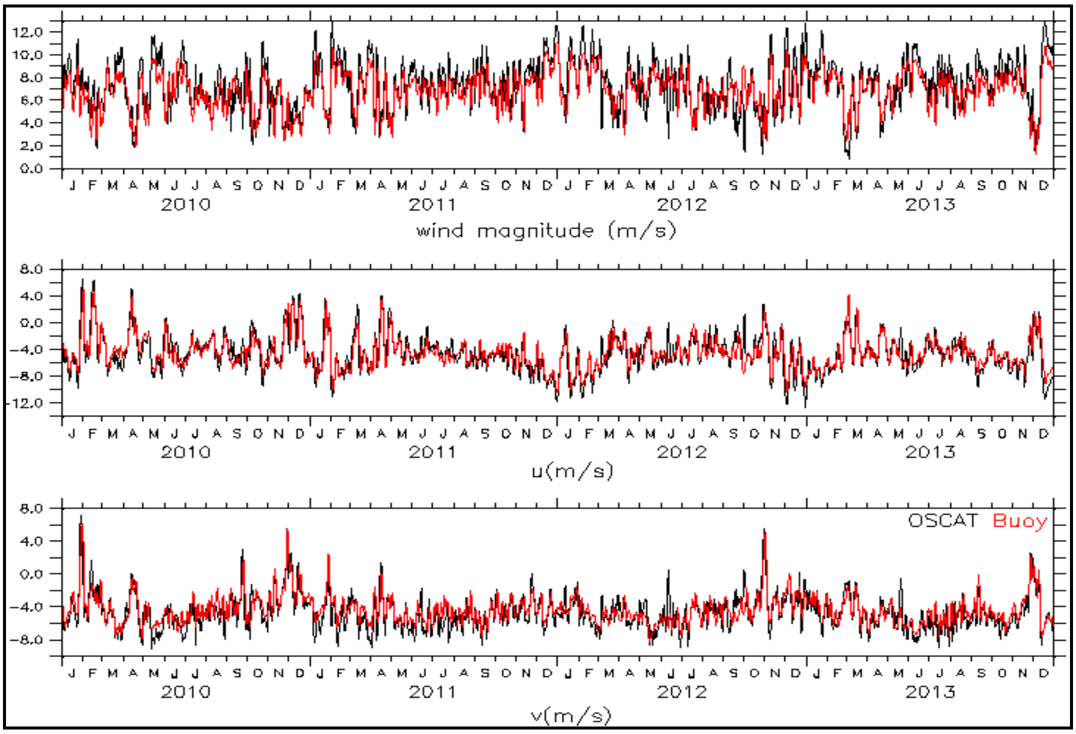

Figure 6: Time series from OSCAT daily and buoy at location 21°N and 23°W in the Atlantic Ocean. Top panel shows wind speed magnitude, central panel shows *u* component and bottom panel shows *v* component of wind. Red colour indicates buoy and Black shows OSCAT.

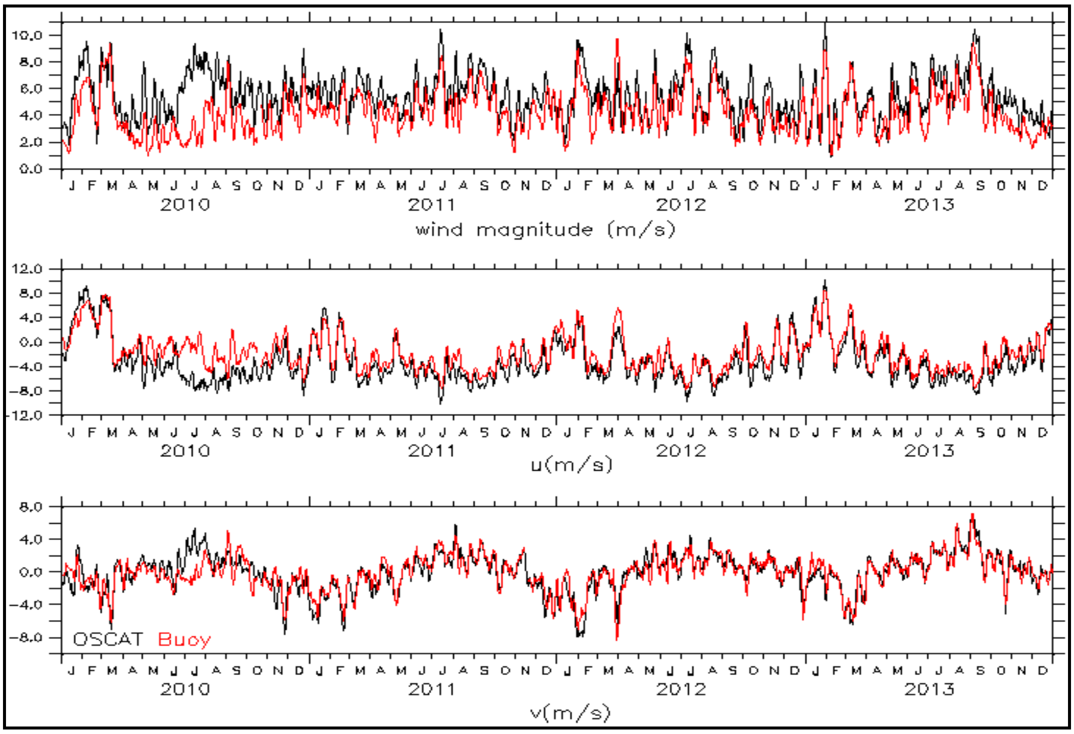

Figure 7: Time series from OSCAT daily and buoy at location 8°S and 165°E in the Pacific Ocean. Top panel shows wind speed magnitude, central panel shows *u* component and bottom panel shows *v* component of wind. Red colour indicates buoy and Black shows OSCAT.

3.2 Comparison with ASCAT

Gridded wind fields of daily and two-day interpolated OSCAT data are compared with ASCAT data which is re-sampled to match the spatial resolution of OSCAT. Comparison is carried out separately for daily and two-day composite interpolated winds. The inter-comparison is mainly carried out based on correlation, bias and RMSD for both annual as well as seasonal wind conditions over the global oceans. Figure 8 shows the spatial correlation between ASCAT and OSCAT. The top panel represents daily and the bottom panel represents the two-day correlation plots. From this figure, it can be inferred that both the datasets are matching very well with each other over the global oceans with positive correlation values greater than 0.7. Figure 9 shows the correlation between ASCAT and OSCAT for the northern Indian Ocean region where the correlation values is almost equal to 1 confirming the results of the gridded OSCAT product comparison with *in situ* data as seen in the figure 4a. Poor correlation of ~ 0.4 to 0.5 is observed along the equator, which could be due to poor sampling by scatterometers in the tropical regions (Bentamy and Fillon, 2012). Figure 10, shows the bias between ASCAT and OSCAT, wherein, it is observed that the bias is negligible over most of the regions. Majority of the differences were observed along the tropical regions of the Pacific and the Atlantic, where the bias is approximately 1 ms^{-1}. This could be due to the effect of sea surface temperature on sea surface wind as opined by Chelton & Frelich (2005) and Bentamy & Fillon (2012). The behaviour of *u* and *v* components slightly differ from each other, particularly to the south of 60°S latitude where the biases are high in case of *u* wind for both daily as well as two-day composite, with little variability in biases for *v* component of wind. Positive bias for *v* over most of the global ocean indicates slight underestimation of OSCAT over ASCAT for both daily and two day composites except in the northern Indian Ocean and the northern Pacific. Figure 11 shows the RMSD for *u* and *v* components of wind where, top panel represents daily and bottom panel represents two-day composite. Low RMSD is observed in the tropical regions while higher values (> $3ms^{-1}$) are observed in the higher latitudes in the case of both daily and two-day composite *u* and *v* winds.

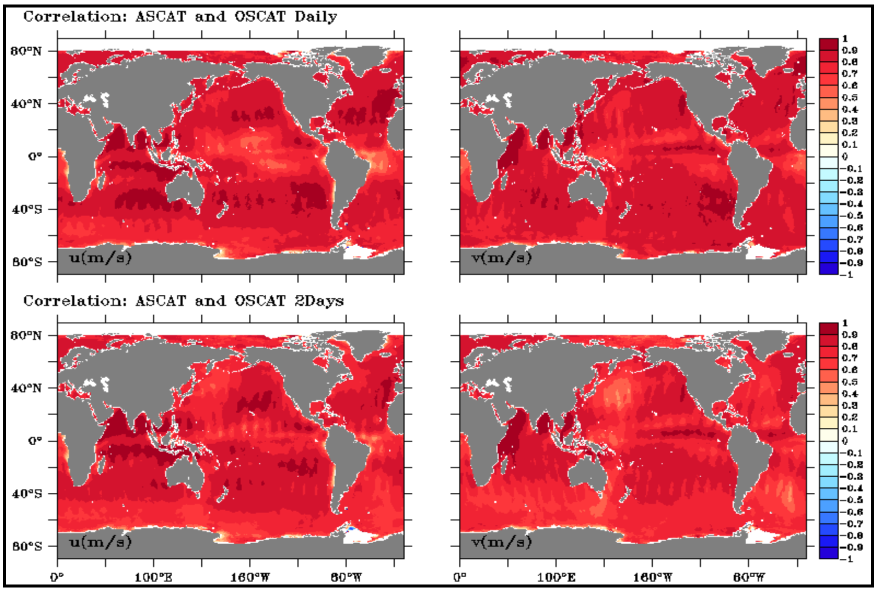

Figure 8: Correlation between ASCAT and OSCAT daily (top panel) and two-day (bottom panel) data.

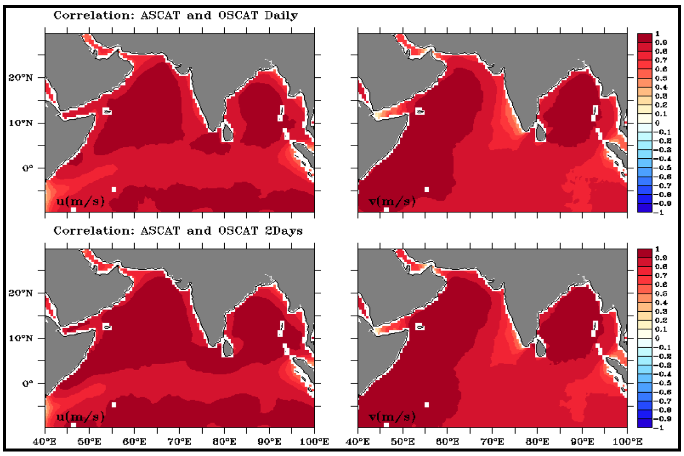

Figure 9: Correlation between ASCAT and OSCAT in the northern Indian Ocean

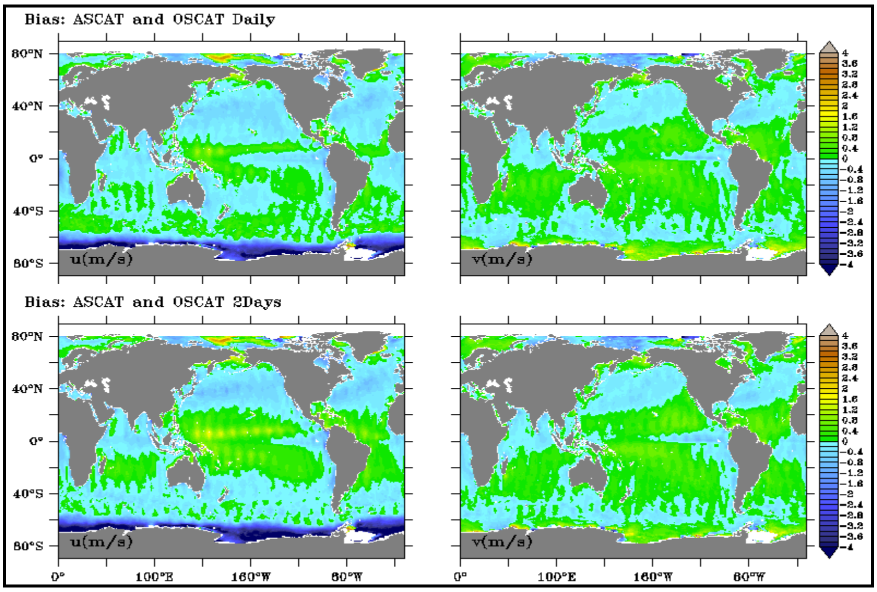

Figure 10: Correlation between ASCAT and OSCAT daily (top panel) and two-day (bottom panel) data.

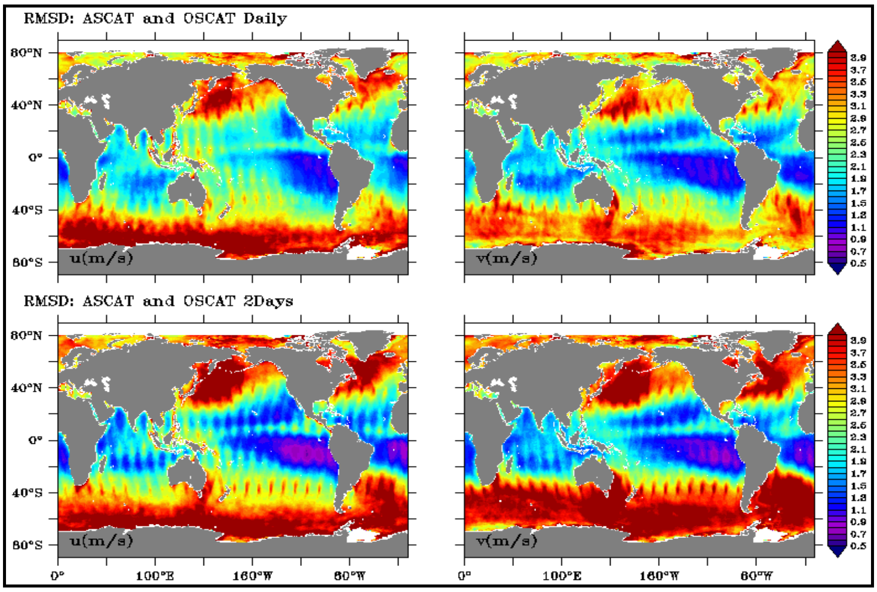

Figure 11: RMSD between ASCAT and OSCAT daily (top panel) and two-day (bottom panel) data.

3.2.1 Seasonal comparison

Comparison of daily data: OSCAT and ASCAT are also compared seasonally to evaluate gridded OSCAT wind fields under different wind conditions. Seasonal mean wind fields combining the months of January, February and March (JFM), April, May and June (AMJ), July, August and September (JAS) and October, November and December (OND) were computed. Statistics like correlation, bias and RMSD were then obtained for daily and two-day composites separately. Figures 12, 13 and 14 show the correlation, bias and RMSD for daily data of *u* component.

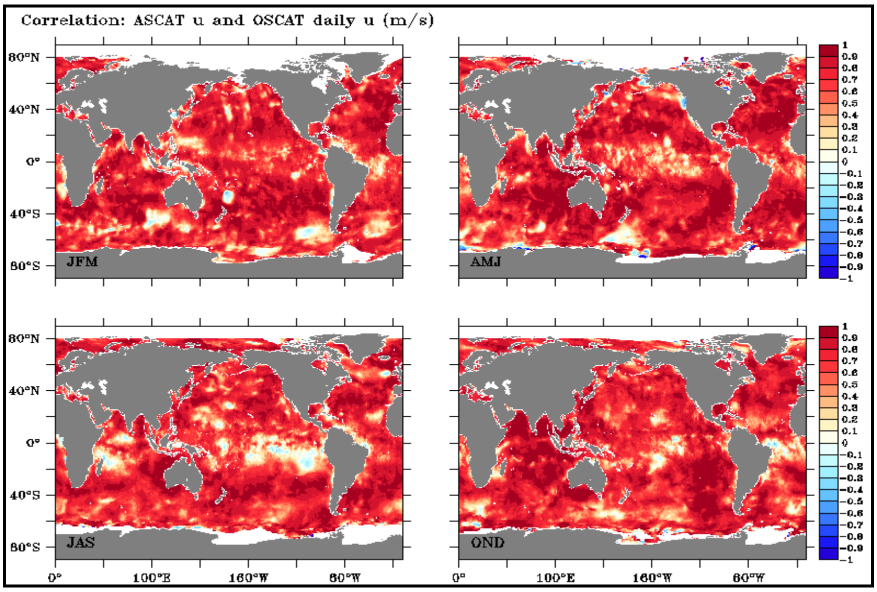

Figure 12: Correlation between *u* component of ASCAT and OSCAT daily for different seasons.

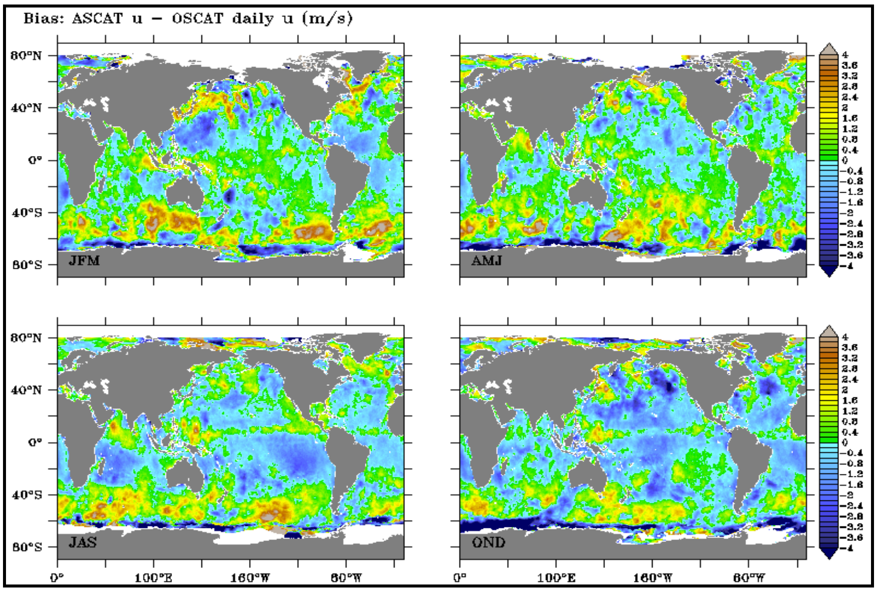

Figure 13: Bias between *u* component of ASCAT and OSCAT daily for different seasons.

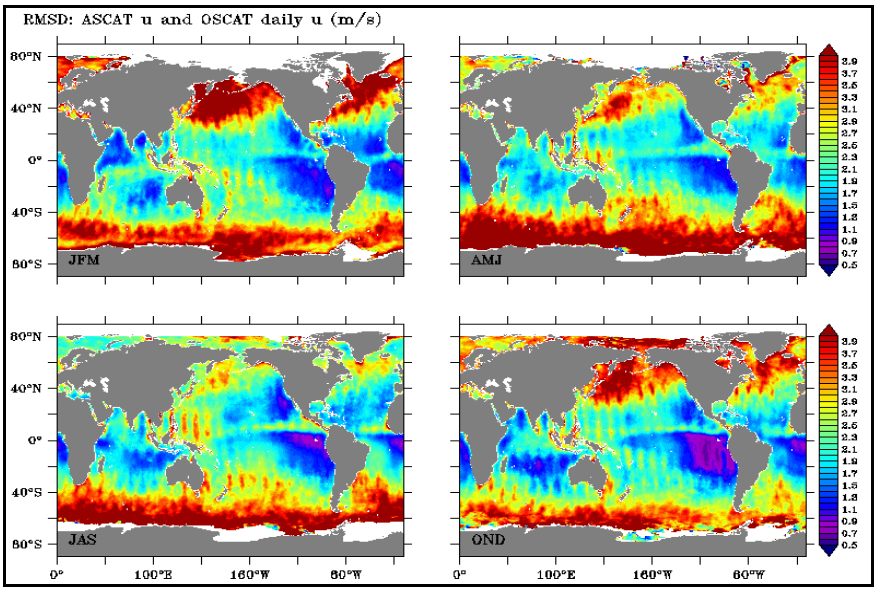

Figure 14: RMSD between *u* component of ASCAT and OSCAT daily for different seasons.

From the seasonal analysis, correlation between ASCAT and OSCAT daily products is observed to be good for most of the global oceans except at few regions in the tropics. Bias is also negligible over most of the oceans except in the high wind speed areas to the south of 40°S during all the seasons. RMSD is found to be very low in the tropic and sub tropical regions as against higher RMSDs in the higher latitudes in both the hemispheres. This is in line with the observations from annual comparison. Similar analysis is carried out for the *v* component as shown in the figures 15, 16 and 17 representing correlation, bias and RMSD.

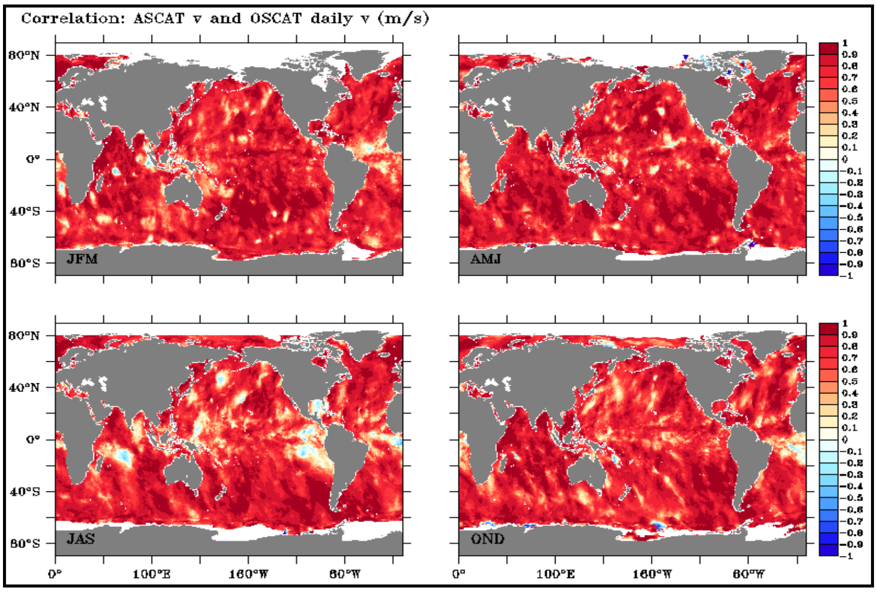

Figure 15: Correlation between *v* component of ASCAT and OSCAT daily for different seasons.

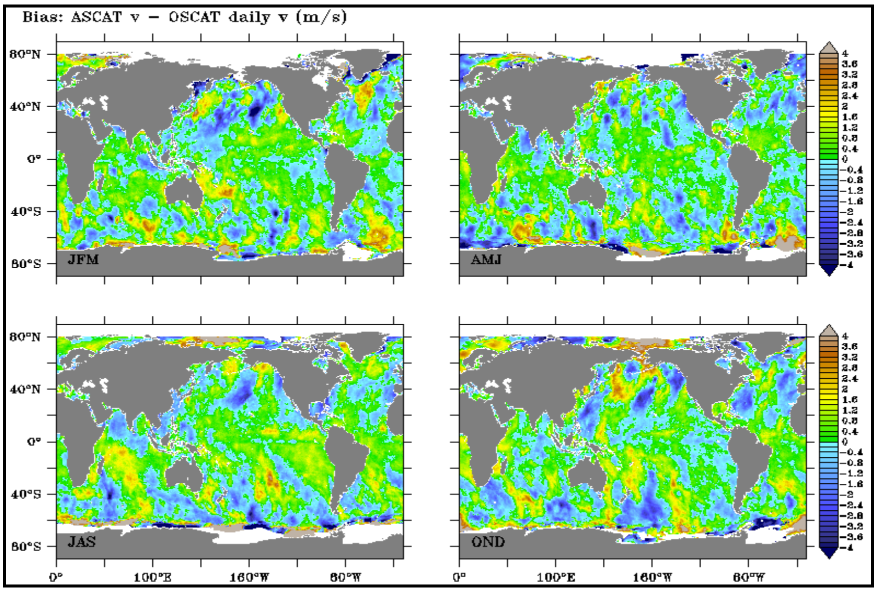

Figure 16: Bias between *v* component of ASCAT and OSCAT daily for different seasons.

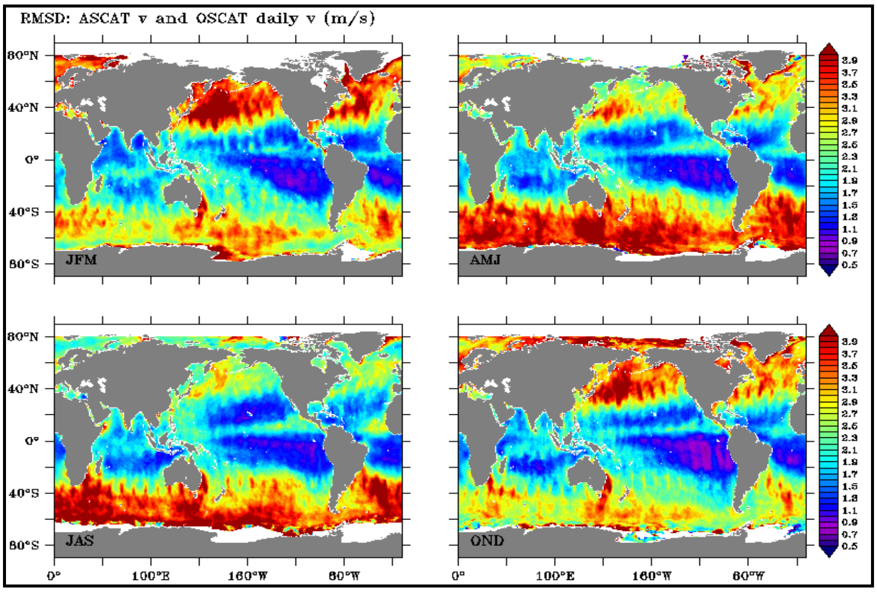

Figure 17: RMSD between *v* component of ASCAT and OSCAT daily for different seasons.

From the figures, it is observed that the comparison of *v* component has shown similar results as that of *u* component. High correlation is observed in most of the regions with a few exceptions. Positive bias of 0 – 2 m s^{-1} is observed over majority of the world oceans. Higher RMSD values are found along the equator in the Atlantic and the Pacific oceans and also towards the higher latitudes especially during the seasons of AMJ and JAS.

Comparison of two-day composite data: Comparison statistics between ASCAT and the two day composite of OSCAT is carried out to evaluate the quality of two day composite winds. Figures 18, 19 and 20 show the correlation, bias and RMSD respectively, between ASCAT *u* component and two-day composite of OSCAT *u* component. The correlation shows that both the datasets match well with each other. The poor correlation in the tropical regions that was observed in the daily data comparison is diminished in the two-day data comparison. Similarly, the bias values are also reduced. Majority of the global oceans are dominated by positive bias indicating the under-estimation of two-day composite OSCAT as compared to ASCAT. Negative biases are predominantly observed in the higher latitudes especially in the southern hemisphere in all the seasons. RMSD comparatively resembles the daily data evaluation, with larger values in the higher latitude regions in the northern hemisphere during JFM and OND seasons and during AMJ and JAS seasons over the southern hemisphere. The inference from daily and two-day comparison of OSCAT *u* component with ASCAT is that the two-day composite of OSCAT is slightly better than the daily gridded wind fields of OSCAT. Similar results are observed for the *v* component as shown in the figures 21, 22 and 23. Therefore we can deduce that the two-day composite of OSCAT wind is more consistent.

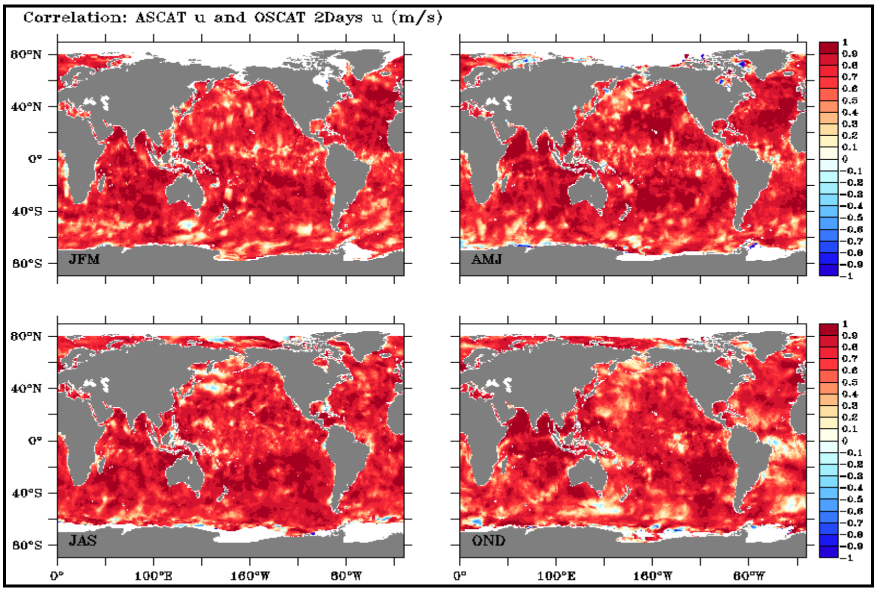

Figure 18: Correlation between *u* component of ASCAT and OSCAT two-day composite, for different seasons.

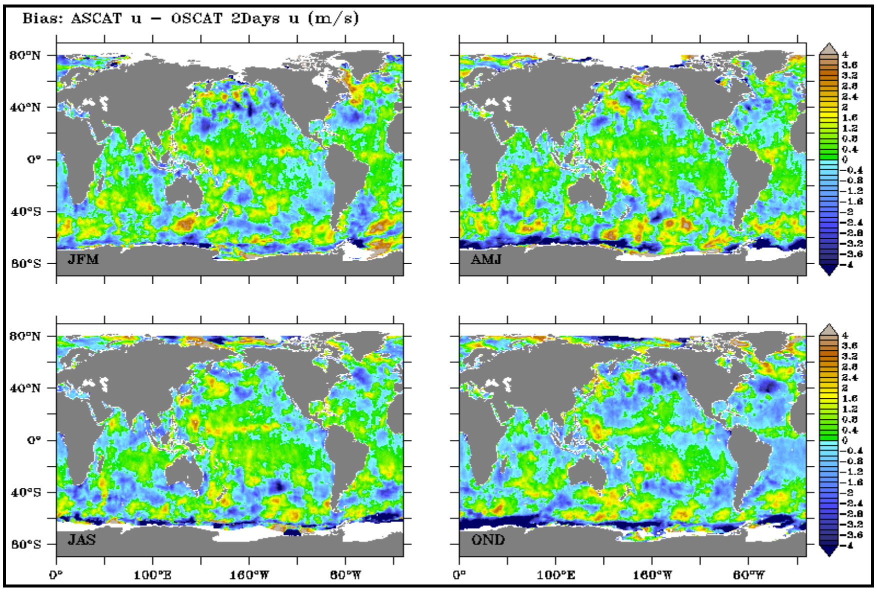

Figure 19: Bias between *u* component of ASCAT and OSCAT two-day composite for different seasons.

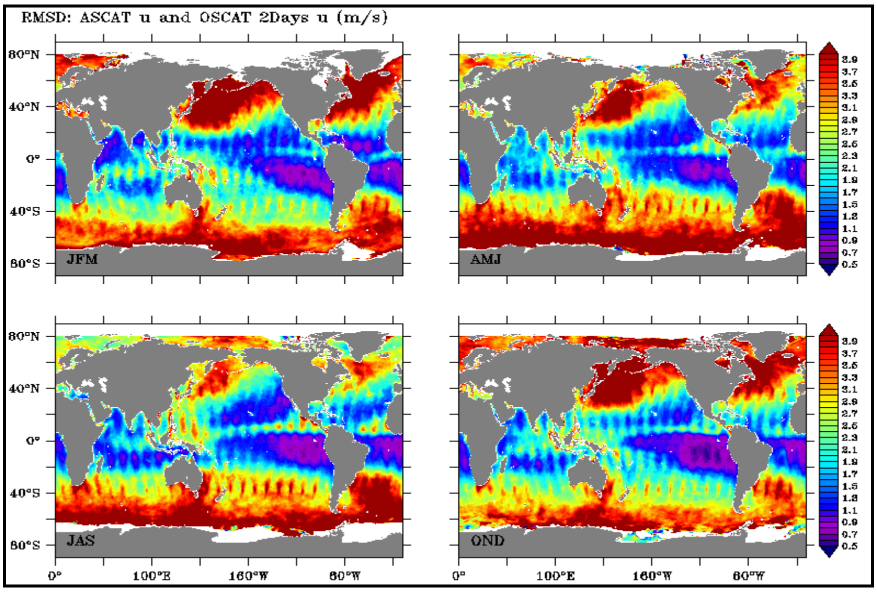

Figure 20: RMSD between *u* component of ASCAT and OSCAT two-day composite for different seasons.

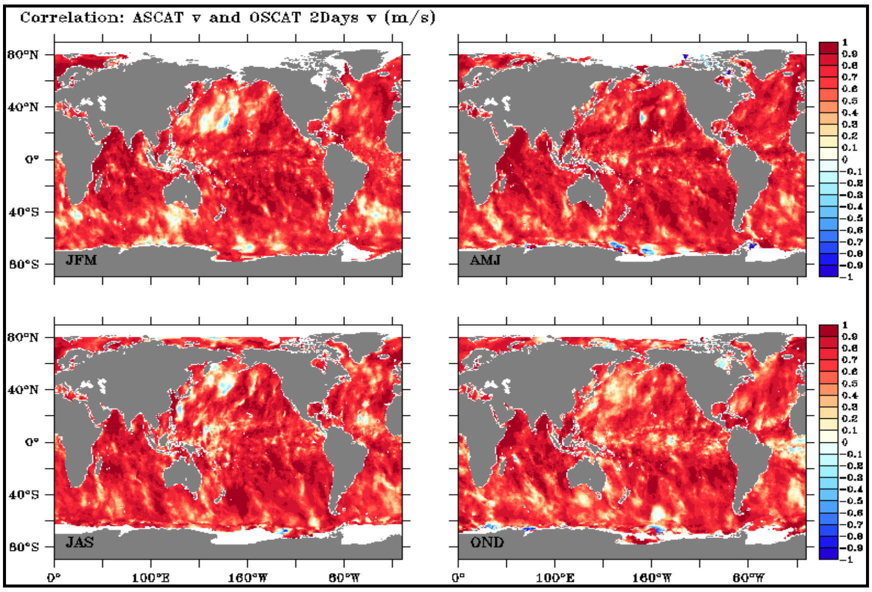

Figure 21: Correlation between *v* component of ASCAT and OSCAT two-day composite, for different seasons.

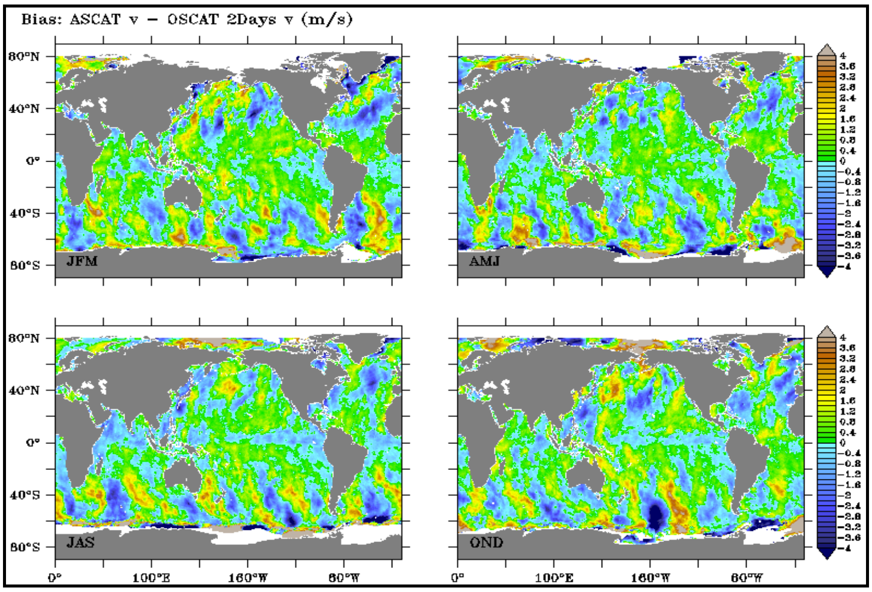

Figure 22: Bias between *v* component of ASCAT and OSCAT two-day composite for different seasons.

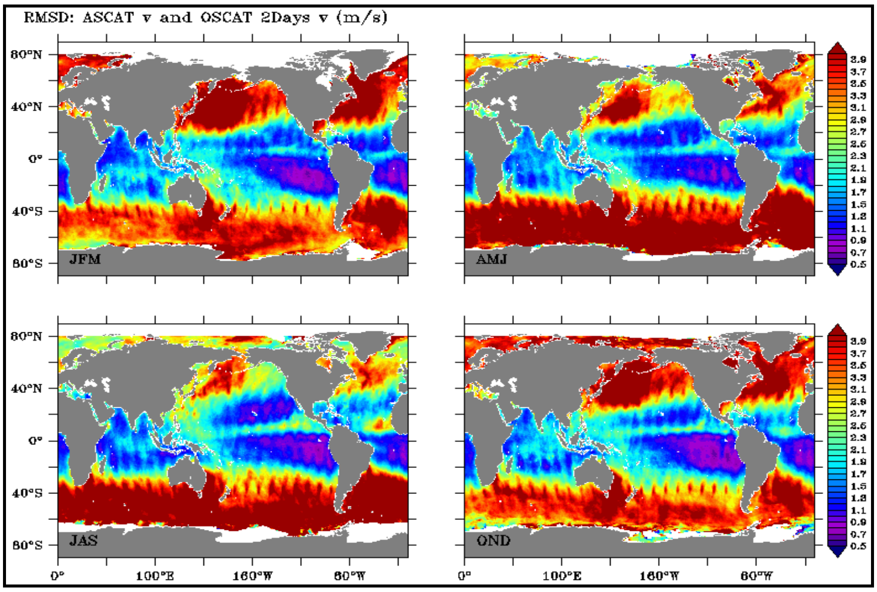

Figure 23: RMSD between *v* component of ASCAT and OSCAT two-day composite during different seasons.

4 Conclusions

Measurement of sea surface winds is vital for many operational purposes of which foremost are studies related to monsoons, modelling and cyclone. In order to undertake these studies, one needs to have quality wind data. Given the spatial and temporal constraints involved in *in situ* data, satellite based wind measurement have become a vital input in met-ocean studies. The objective of this study is to generate daily and two-day composite global gridded ocean surface wind fields from OSCAT observations following the evaluation of the product against *in situ* (buoys) and ASCAT scatterometer data products. Variance inverse method model "DIVA" is used for generation of gridded wind fields for the entire operational period of OSCAT spanning 2010 to 2013. Analysis is carried out for daily and seasonal wind speed values for both *u* and *v* components of winds, separately. The results are found to be good and comparing well with both *in situ* as well as ASCAT data. Two-day composite data is in better agreement than the daily data and the best match is obtained for the wind speed range of 3 – 10 ms^{-1}. Derived products like wind stress and the curl of wind stress can be produced by using this data which have potential applications in the studies like cyclones, upwelling and surface divergence over the oceans.

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