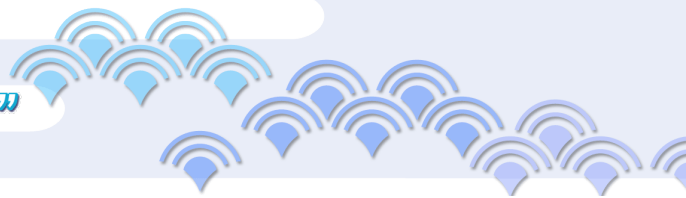




水循環変動観測衛星「しずく」

Global Change Observation Mission-Water "SHIZUKU"



AMSR2 Research Product Validation Result of Sea Ice Motion Vector

Japan Aerospace Exploration Agency
Earth Observation Research Center

Product overview



Product	Product ID	Area	Spatial resolution	Goal accuracy	Range	Remarks
Sea ice motion vector	SIM	Ocean at high latitudes*	50 km	± 6 cm/s	0-40 cm/s	An accuracy is assessed for eastward and northward components, respectively.

***Products for the Arctic Ocean are now available. Products for the Antarctic Ocean are in preparation.**

Algorithm overview

Developer	K. Shimada (Tokyo University of Marine Science and Technology)	N. Kimura (Atmosphere and Ocean Research Institute of The University of Tokyo)
Developer ID	Y	R
Method	Motion tracking technique based on the maximum cross correlation method	
Channels	18, 23, 36, 89 GHz (H, V)	18, 36 GHz (H, V)
Resolution of input imageries	5 km	10 km
Ancillary data	Reanalysis wind	-
Point	Optimal vectors are provided depending on the success of the screening of erroneous vectors.	Averaged vectors are provided.

Products developed by K. Shimada and N. Kimura are hereinafter referred to as SIM(Y) and SIM(R), respectively.

Validation data, area

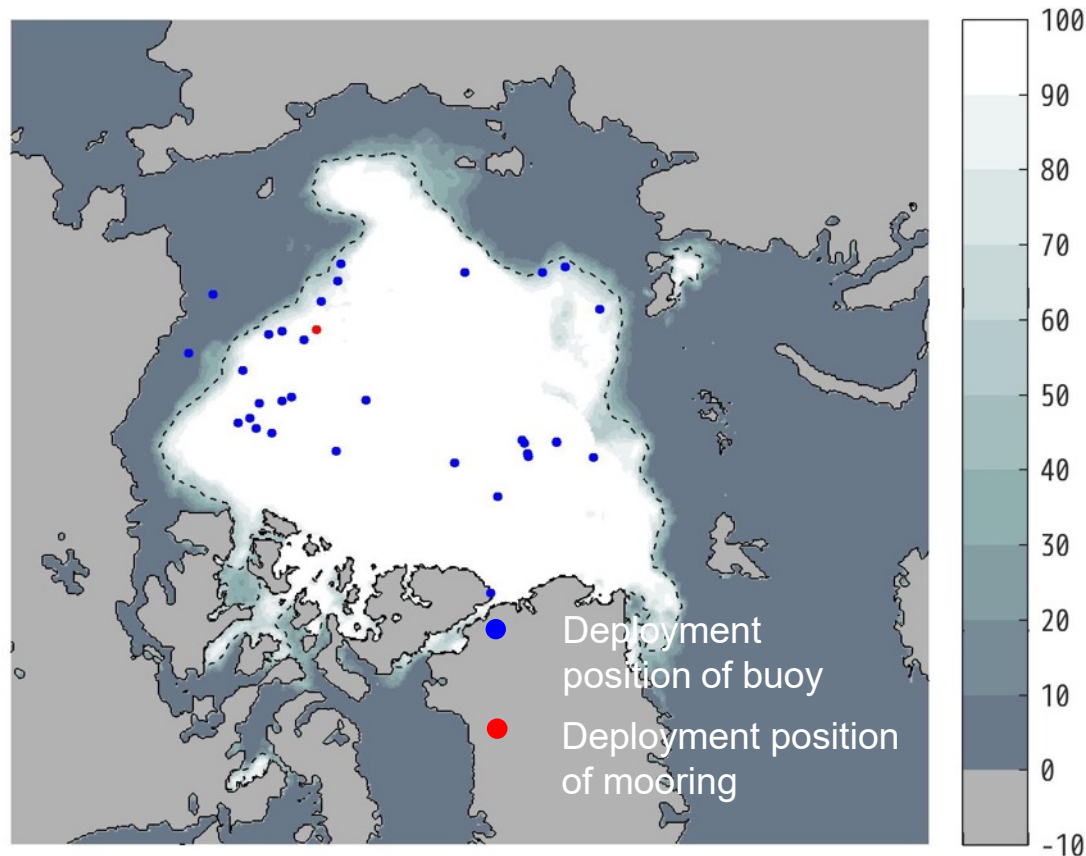
- Velocities estimated by location of ice drifting buoys (north of the Bering and Fram Straits)

International Arctic Buoy Programme (IABP): available at: <http://iabp.apl.washington.edu/index.html>.

- Velocities measured by an Acoustic Doppler Current Profile (ADCP) attached to the ocean mooring (the Pacific sector of the Arctic Ocean)

Duration

- 2013–2015



Example of in situ data distributions (2013/2014)

Validation result

1 SIM(Y)

1-1 Comparisons with drifting buoy data

1-2 Comparisons with moored ADCP data

2 SIM(R)

2-1 Comparisons with drifting buoy data

2-2 Comparisons with moored ADCP data

1-1 SIM(Y) : Comparisons with drifting buoy data

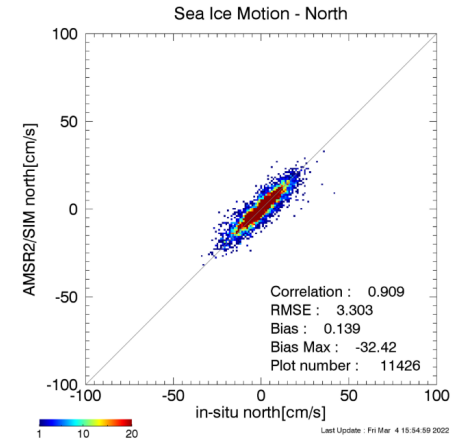
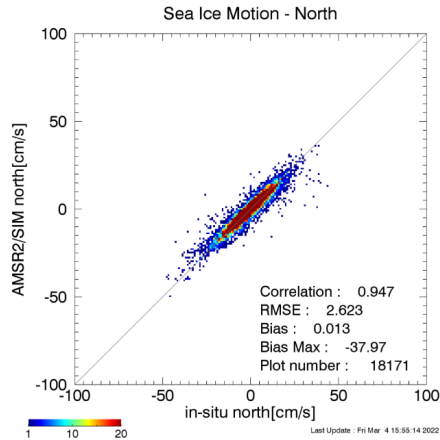
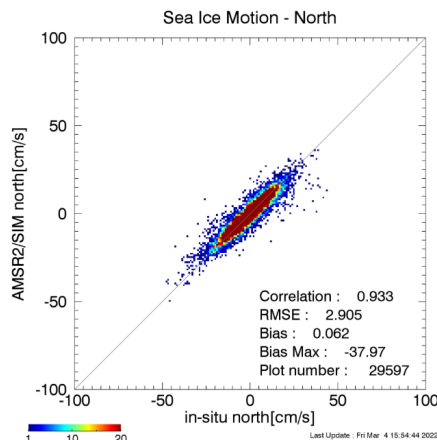
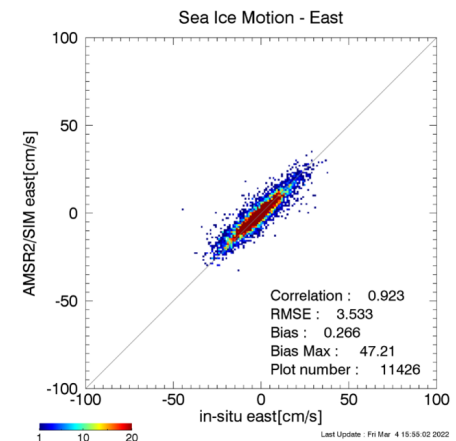
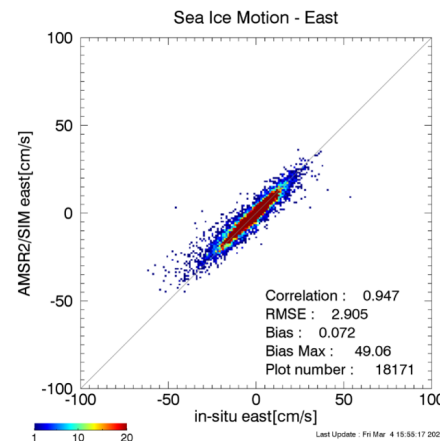
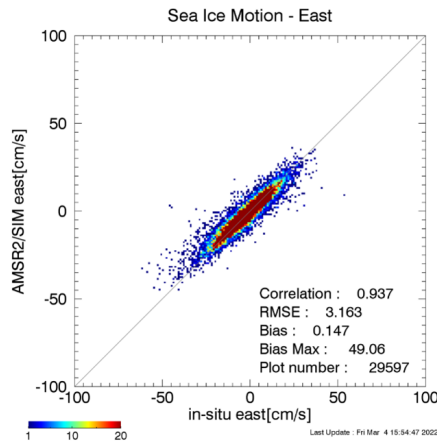
Eastward
velocity

Northward
velocity

Year-round

Winter
(October-April)

Summer
(May-September)

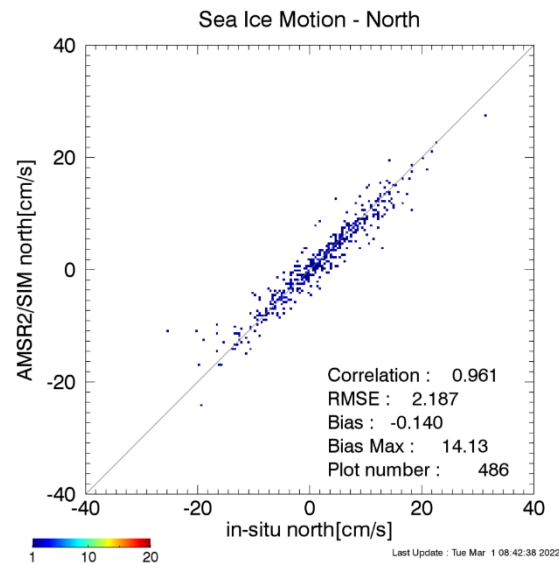
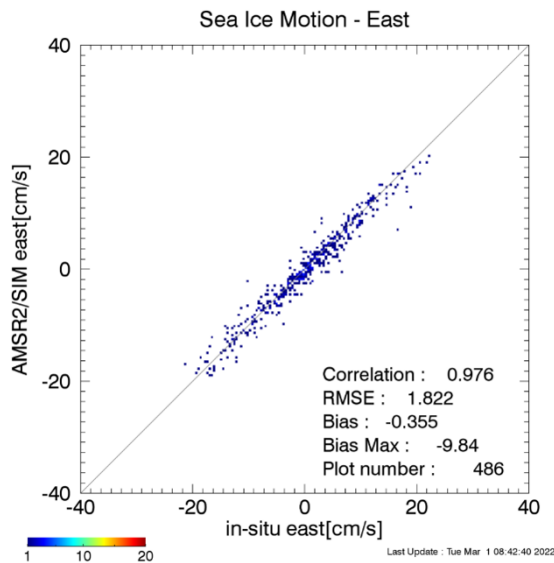


	Year-round		Winter		Summer	
	E	N	E	N	E	N
RMSE [cm/s]	3.16	2.91	2.91	2.62	3.53	3.30

1-2 SIM(Y) : Comparisons with moored ADCP data

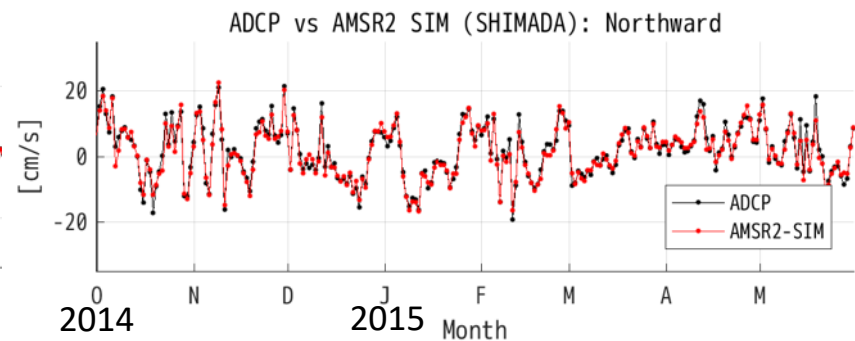
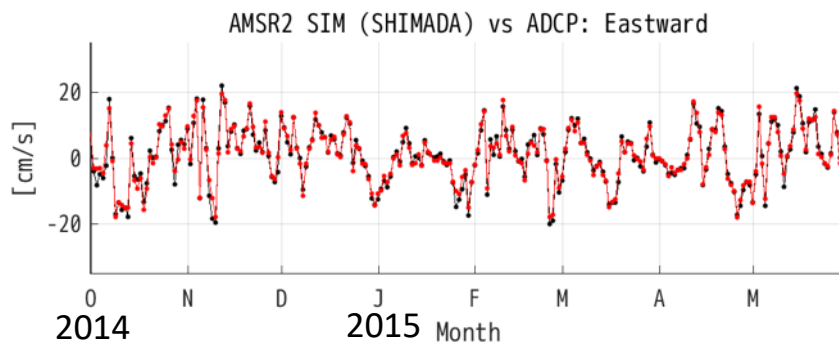
Eastward velocity

Northward velocity



	E	N
RMSE [cm/s]	1.82	2.19

October-May 2013/2014-2014/2015



2-1 SIM(R) : Comparisons with drifting buoy data

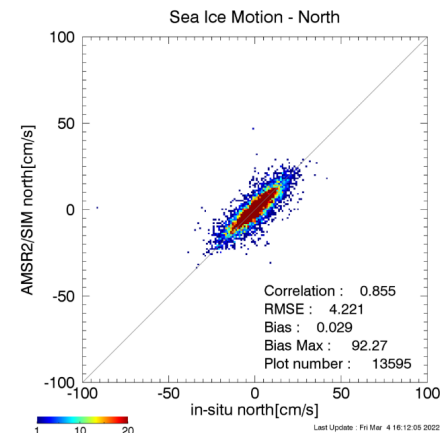
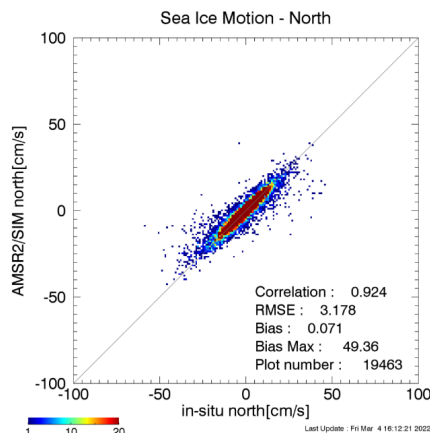
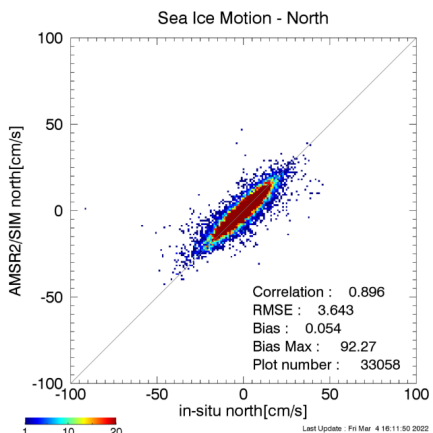
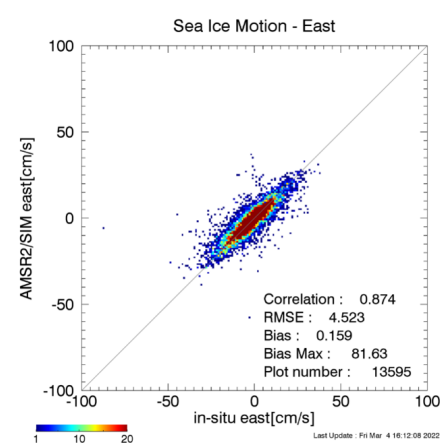
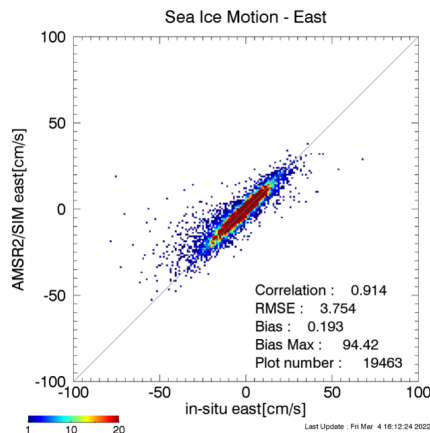
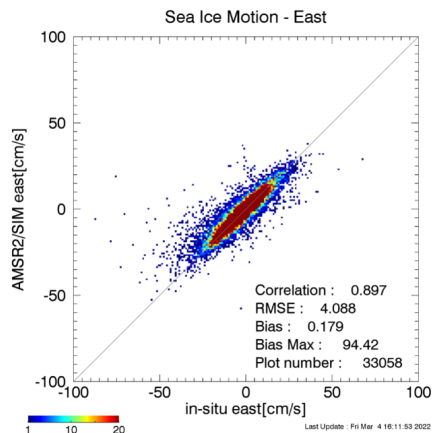
Eastward
velocity

Northward
velocity

Year-round

Winter
(October-April)

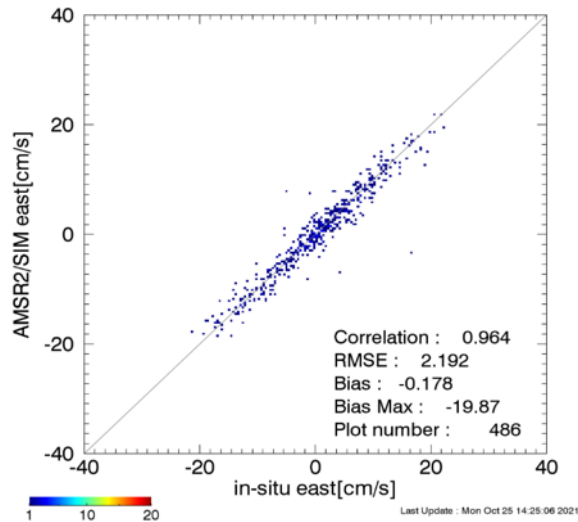
Summer
(May-September)



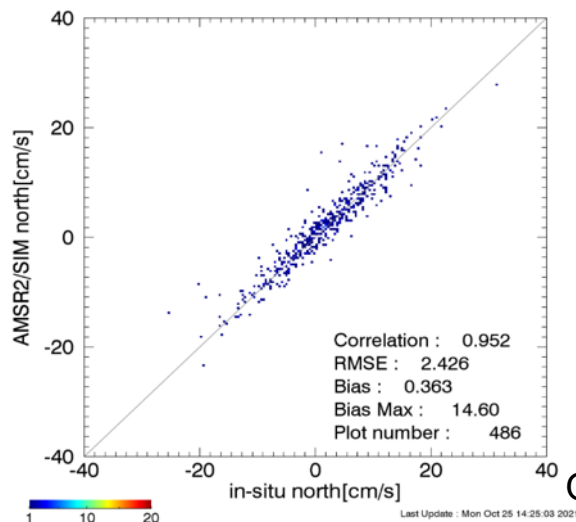
	Year-round		Winter		Summer	
	E	N	E	N	E	N
RMSE [cm/s]	4.09	3.64	3.75	3.18	4.52	4.22

2-2 SIM(R) : Comparisons with moored ADCP data

Eastward velocity



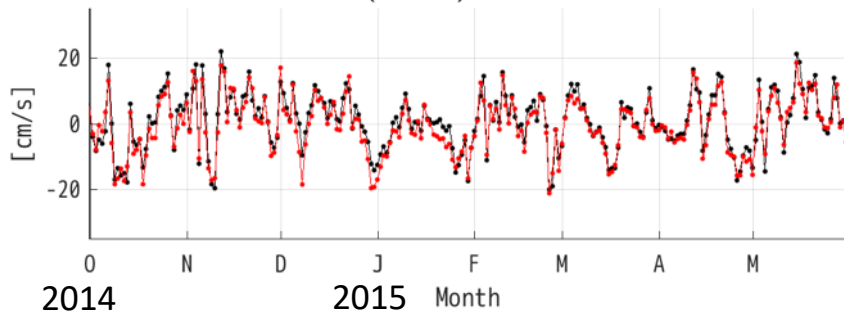
Northward velocity



	E	N
RMSE [cm/s]	2.19	2.43

October-May 2013/2014-2014/2015

AMSR2 SIM (KIMURA) vs ADCP: Eastward



ADCP vs AMSR2 SIM (KIMURA): Northward

