

# **GCOM-W/AMSR2 Level 3 Sea Ice Motion Vector**

## **Product Description**

**(Research Product, Product ID: SIM(Y))**

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## 1 Introduction

This document describes a stored data set of the AMSR2 sea ice motion vector (SIM) product developed by Prof. K. Shimada (Tokyo University of Marine Science and Technology, developer ID: Y). The product is hereinafter referred to as SIM(Y) using the developer ID. A product specification is given in Table 1.

Table 1 Product specification of AMSR2 SIM

Areas	Projection	Spatial resolution	Temporal resolution	Goal accuracy
Ocean at high latitudes *1	Polar stereographic (PS) *2	50 km	1 day	$\pm 6$ cm/s

\*1 Products for the northern hemisphere are now available, and those for the southern hemisphere are in preparation.

\*2 Latitude and longitude information of SIM products is different from that of other AMSR2 products mapped onto the PS projection.

## 2 Product description

While Ver. 1.0 products are distributed by an HDF format, Ver. 2.0 products are distributed by a NetCDF format.

### 2.1 Ver. 1.0 products

The structure of the Ver. 1.0 products is shown in Table 2.

Table 2 AMSR2 SIM product file structure

Structure		HDF Data	Content
Header	Product Metadata	Attribute	Describe unique information of the product data. *
Data		Data set	Contents of the stored data set are shown in Table 3.

\*For information on header and product metadata, as well as file name, dummy data, and projection, please refer to the GCOM-W1 AMSR2 Higher Level Product Format Specification ([https://gportal.jaxa.jp/gpr/assets/mng\\_upload/GCOM-W/AMSR2\\_Higher\\_Level\\_Product\\_Format\\_EN.pdf](https://gportal.jaxa.jp/gpr/assets/mng_upload/GCOM-W/AMSR2_Higher_Level_Product_Format_EN.pdf)).

Ver. 1.0 products contain a data set listed in Table 3. The content and data array are completely different from those of other AMSR2 products.

Table 3 Data set list of Ver. 1.0 products

Data	Data type	Dimension xc = 131, yc = 138, nc = 1.	Description	Scale factor	Unit	Remark
u	Float	(yc, xc)	U component	1	cm/s	-
v	Float	(yc, xc)	V component	1	cm/s	-
ve	Float	(yc, xc)	Eastward component	1	cm/s	-
vn	Float	(yc, xc)	Northward component	1	cm/s	-
x	Float	(yc, xc)	X coordinate of PS projection	1	-	-
y	Float	(yc, xc)	Y coordinate of PS projection	1	-	-
lat	Float	(yc, xc)	Latitude	1	degrees north	Range: 44 ~ 90
lon	Float	(yc, xc)	Longitude	1	degrees east	Range: -180 ~ 180
fp	Float	(yc, xc)	Frequency and polarization	1	GHz (frequency)	Meanings: -18 : 18GHz (V), +18 : 18GHz(H), -23 : 23GHz (V), +23 : 23GHz(H), -36 : 36GHz (V), +36 : 36GHz(H), -89 : 89GHz (V), +89 : 89GHz(H),
ws	Float	(yc, xc)	Window size to calculate cross correlation	1	km	-
xcorr	Float	(yc, xc)	Cross correlation coefficient	1	-	-

qf	Float	(yc, xc)	Quality flag	1	-	Meanings: 0 : normal, 1: spatial average or extrapolated value, 8 : ocean or land.
ct	String	(nc)	Central time	-	YYYYMMDD hh:mm	-
t	Float	(yc, xc)	Time information	1	min	Time from ct

## 2.2 Ver. 2.0 products

The distribution format of AMSR3 products will be NetCDF; accordingly, the format of AMSR2 SIM(Y) products is changed from HDF to NetCDF for consistent use in the AMSR series. Ver. 2.0 products contain a data set listed in Table 4.

Table 4 Data set list of Ver. 2.0 products

Data	Data Type	Dimension xc = 152, yc = 224, nc = 1.	Description (long_name)	Scale factor	Unit	Remark
Data1	single	(xc, yc)	U Component	1	cm/s	-
Data2	single	(xc, yc)	V Component	1	cm/s	-
Data3	single	(xc, yc)	Eastward Component	1	cm/s	-
Data4	single	(xc, yc)	Northward Component	1	cm/s	-
Data1_Quality	uint8	(xc, yc)	Quality Flag	-	-	Quality flag for Data1-4.
Latitude	single	(xc, yc)	Latitude	1	degrees-north	-
Longitude	single	(xc, yc)	Longitude	1	degrees-east	-
TimeInformation	int32	(xc, yc)	time	1	Seconds	Seconds since 2017-11-30T00:00:00Z.

To get coordinate information in the polar stereographic projection of Ver. 2.0, please download the file SIM\_Y\_xy.dat in the GCOM-W research product distribution service. The stored information is listed in Table 5.

Table 5 Data set content of polar stereo coordinate information

Data	Data type	Dimension xc = 152, yc = 224.	Description	Scale factor	Unit	Remark
X	float	(xc, yc)	X	1	-	Missing value: -9999
Y	float	(xc, yc)	Y	1	-	Missing value: -9999

In addition, the granule ID is set as follows:

Ex. GW1AM2\_YYYYMMDD\_tttXPPP\_xLLKKKAAdVV\_vaaappp

GW1: Satellite name (GCOM-W)

AM2: Sensor name (AMSR)

YYYYMMDD: Date

ttt: Statistical duration (01D: daily)

X: Orbit (B: both ascending and descending)

PPP: Projection type (PN1: polar stereographic in northern hemisphere 1)

x: Processing type: (R: research product)

LL: Processing level and size code (3P: PS 50 km)

KKK: Product ID (sea ice motion vector: SIM)

AA: Area (PO: Polar ocean)

d: Developer ID

v: Product version

aaa: Algorithm version

ppp: Parameter version

## Appendix Sample program

Sample programs of Python to output data set to screen are given as listed in Table A1.

Table A1 Python sample programs

File name	Description of sample program	Remark
sample_simy.py	Print the values of data set of SIM(Y) to output screen.	<ul style="list-style-type: none"><li>• The programs are for Ver. 1.0 products.</li></ul>