

The contribution of global ocean observation of continuity of HY-2 satellite

HY-2 satellite, an ocean dynamic environment observation satellite, mainly objective is monitoring and detecting the parameters of ocean dynamic environment. These parameters include sea surface wind fields, sea surface height, wave height, gravity field, ocean circulation and sea surface temperature etc.

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1. Introduction

HY-2 satellite scatterometer provides sea surface wind fields, which can offset the observation gap of the plan of global scatterometer. At the same time, HY-2 satellite altimeter provides sea surface height, significant wave height, sea surface wind speed and polar ice sheet elevation, which can offset the observation gap of the plan of global altimeter around 2012, and can offset the observation gap of JASON-1&2 at polar area. More details as follows.

2. Observation of sea surface wind fields

The analysis accuracy of wind field for ocean-atmosphere can improve 10-20% by using the satellite scatterometer data, by which can improve greatly the quality of initial wind field of numerical atmospheric forecast model in coastal ocean. Satellite scatterometer data has play important role on study of large-scale ocean phenomenon, such as sea-air interactions, ocean circulation, EI Nino etc.

The figure 1 shows that QuikSCAT scatterometer has operational application in 1999, but it has not the following plan. ERS-2 scatterometer mission has transferred to METOP ASCAT in 2006. GCOM-B1 will launch in 2008, one of its payloads is an ocean vector wind measurement (OVWM) instruments, and it also called AlphaScat. This is SeaWinds follow-on. HY-2 satellite scatterometer will launch in 2010, it can fill up the gap of scatterometer observation after 2012. At the same time, HY-2 scatterometer is Ku band, therefore it can measure wind field higher sensitivity and signal-noise- ratio than ASCAT. So, HY-2 satellite scatterometer will become a good supplement to global wind field monitoring and can keep the continuity of global scatterometer observation plan.

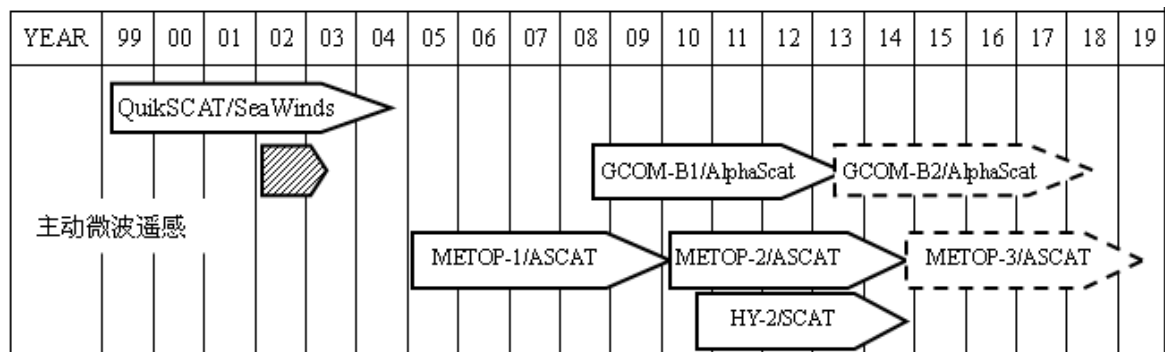


Figure1. The vector wind retrieval instruments and satellites for 1999-2019. The horizontal arrows show the mission duration. A dashed outline, that the mission is under consideration. The short arrow with diagonal hatching represents the SeaWinds sensor on ADEOS-2.

Jason-2	66°	Poseidon3																	
HY-2	99°	RA-1																	
Sentinel 3	98.5	Altimeter																	

The table 1 shows that the technical data are in basic agreement with HY-2 satellite altimeter and other same kind of altimeters. So, HY-2 satellite altimeter measures the sea surface height, sea surface wind speed and significant wave height can meet the requirements of application.

Table3 the technical data of HY-2 altimeter and other altimeters

Satellite	GFO-1	JASON-1	ENVISAT	JASON-2	HY-2
Orbit (km)	880	1336	800	1336	963&965
Frequency (GHz)	13.5	13.6&5.3	13.575&3.2	13.6&5.3	13.58&5.25
Inclination (°)	108	66	98.5	66	99.34015°
Exact repeat cycle (days)	17	10	35	10	14&168
Life	1998~	2001~	2002~	2008~	2010~
Sea surface height (cm)	1.8	3.3	<4.5	3.3	<5
Wave height (cm)	50	25	25	25	50
Wind speed (m/s)	2	1.5	2	1.5	2