## **On-orbit performance of HY-1C/COCTS**

#### Xianqiang He, Delu Pan, Zhihua Mao

State Key Laboratory of Satellite Ocean Environment Dynamics, Second Institute of Oceanography, Ministry of Natural Resources, Hangzhou, China (\*hexianqiang@sio.org.cn)





## **HY-1C** mission

- □ Launched on Sept. 7, 2018;
- □ Successor of HY-1A (2002-2004) and HY-1B (2007-2016).



Sensor	Bands	Resolution	Swath
COCTS (Chinese Ocean Color and Temperature Scanner)	10 bands (8 bands from 412nm~865nm; 2 TIR bands)	1.1km	~3000km
CZI (Coastal Zone Imager)	4 bands (460nm,560nm, 650nm,825nm)	50m	~1000km
UVI (Ultra Violet Imager)	2 bands (355nm, 385nm)	550m	~3000km

### Daily global coverage



#### False color image on 16 Jan., 2019 (only with SZA<85° for scene center)

### **Cross-calibration of HY1C/COCTS by Aqua/MODIS**



### **Atmospheric correction algorithm**

- > NIR-based algorithm was adopted;
- LUTs for Rayleigh scattering, ratio of path radiance to Rayleigh radiance Lpath/Lr (instead of aerosol scattering LUTs), atmosphere diffuse transmittance were generated by vector RT model for coupled oceanatmosphere system (PCOART) (He et al., JQSRT, 2010; He et al, RSE, 2018).
- 20 aerosol models were defined based on Shettle&Fen(1979).



### **Estimated adjustment gains**



![](_page_5_Figure_2.jpeg)

### **Estimated polarization response coefficients**

![](_page_6_Figure_1.jpeg)

#### HY1C/COCTS vs. Aqua/MODIS 8-days composited Lwn (2018.10.24-31)

![](_page_7_Picture_1.jpeg)

![](_page_8_Picture_0.jpeg)

mW/(cm<sup>2</sup>umsr)

#### HY1C/COCTS vs. Aqua/MODIS 8-days composited Lwn (2018.10.24-31)

![](_page_9_Figure_1.jpeg)

#### Validation with AERONET-OC measured Lwn

![](_page_10_Figure_1.jpeg)

#### HY1C/COCTS vs. Aqua/MODIS daily chla (2018.9.18)

![](_page_11_Picture_1.jpeg)

#### Daily Chla from HY1C/COCTS, Aqua/MODIS and SNPP/VIIRS

![](_page_12_Picture_1.jpeg)

#### HY1C/COCTS vs. Aqua/MODIS 8-days composited chla (2018.10.24-31)

![](_page_13_Picture_1.jpeg)

![](_page_13_Picture_2.jpeg)

# HY1C/COCTS vs. Aqua/MODIS 8-days composited SST (2018.10.24-31)

![](_page_14_Picture_1.jpeg)

# HY1C/COCTS vs. Aqua/MODIS and SNPP/VIIRS 8-days composited Chla, SST (2018.10.24-31)

![](_page_15_Figure_1.jpeg)

# HY1C/COCTS vs. Aqua/MODIS and SNPP/VIIRS monthly Chla (2018 Oct.)

![](_page_16_Picture_1.jpeg)

![](_page_16_Figure_2.jpeg)

# HY1C/COCTS vs. Aqua/MODIS and SNPP/VIIRS monthly SST (2018 Oct.)

![](_page_17_Picture_1.jpeg)

![](_page_17_Figure_2.jpeg)

# Summary

- Based on cross-calibration method, adjustment gains and polarization response coefficients were derived for HY1C/COCTS;
- Ocean color and SST products were retrieved by HY1C/COCTS, and validated by comparing with Aqua/MODIS, SNPP/VIIRS and AERONET-OC data, indicating the reliability of HY1C/COCTS products.

### Chinese ocean satellite missions (2015~2025)

![](_page_19_Figure_1.jpeg)

## **Thanks for your attention!**