

Stable Ocean Site for Thermal Emissive Band Inter-Calibration (METimage and VIIRS): Background and Data

Interns: Cristina Zhang, Joshua Choi; Supervisors: Sirish Uprety, Dr. Xi Shao, and Dr. Bin Zhang

- A thermally stable ocean site with the least diurnal variability is critically important in validating radiometric data quality of satellite infrared sensors which may have different local equator crossing time.
- Identifying stable ocean sites can help to establish radiometric consistency among the METimage (local equator crossing time: 09:30) and VIIRS (equator crossing time: 13:30) data products which is a key requirement for environmental applications such as climate change studies.
- In this study, time series of nighttime GOES-16 Advanced Baseline Imager (ABI) (75.2° West) channel 7 (3.9 μm) observations are analyzed by evaluating the diurnal variability to identify the potential ocean location suitable for inter-sensor calibration.
- To further complement the study, Sea Surface Temperature (SST) data product derived from ABI thermal emissive band data will also be analyzed over the same period.
 - Script developed to automatically download the SST data

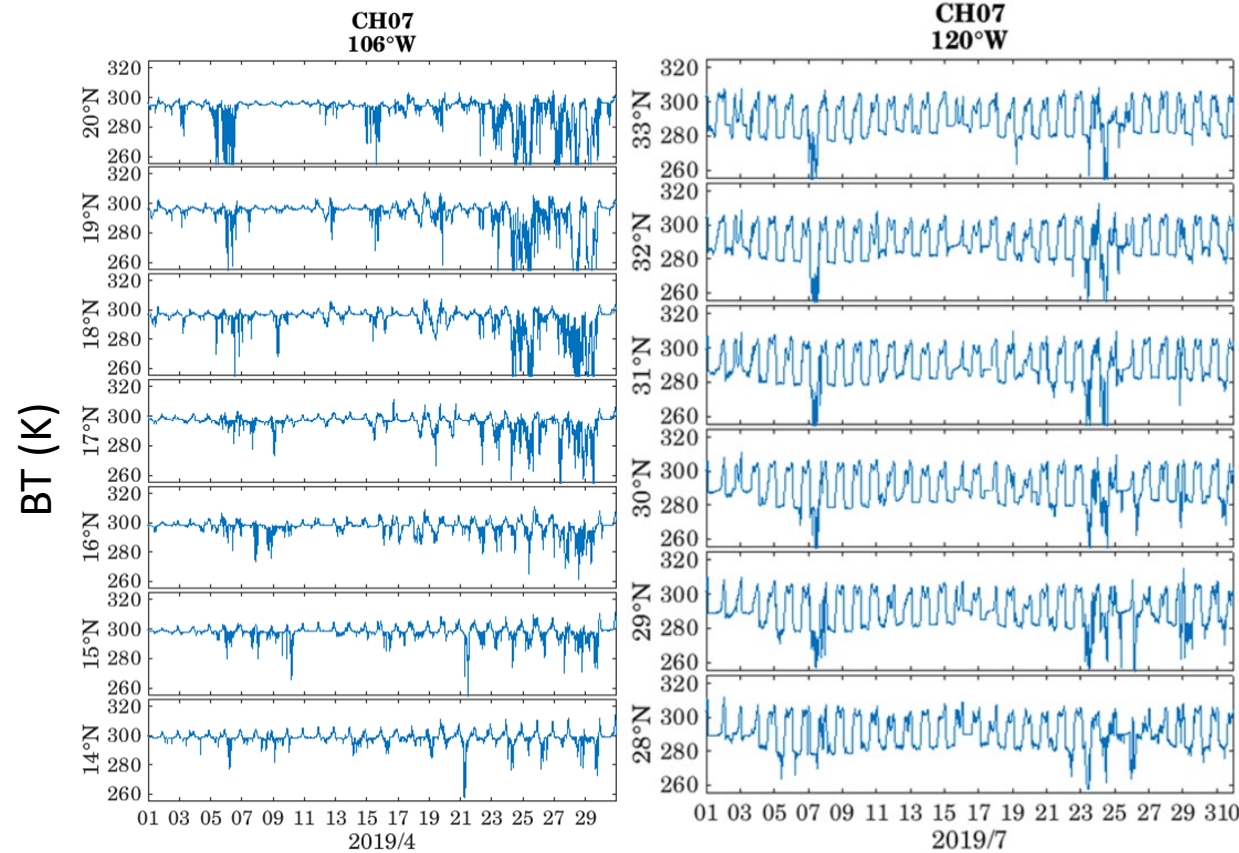


Figure. Sample GOES-16 ABI (3.9 μm) Brightness Temperature (BT) trends over a month at different location (1° lat/lon grid) around Pacific Ocean. Each site show different variability.

Stable Ocean Site for Thermal Emissive Band Inter-Calibration for Future METImage Sensor: Preliminary Result

Intern: Cristina Zhang, Joshua Choi; Supervisors: Sirish Uprety, Dr. Xi Shao, and Dr. Bin Zhang

- Analyzed the time series of ABI CH07 (3.9 um) BT variation over the Baja region (17 to 37 Latitude and -104 to -123 longitude)
- The region was gridded into 1° spacing in both latitude and longitude and Brightness Temperature (BT) over each grid analyzed over 1 year starting from October 2018.
- Preliminary analysis suggest the best location (least diurnal variability) around Lat:30N, and Lon:113/114W (Gulf of California) with temporal standard deviation is ~1K.**
- Presence of cloud makes the time series analysis challenging
- More robust analysis needs:
 - ❖ analyzing other years,
 - ❖ using other TEB bands to complement the study,
 - ❖ gridding over smaller areas (further zooming in),
 - ❖ Extending the region of interest over ocean
 - ❖ analyzing cloud clear areas
- Data collection support
 - VIIRS data download/automation
 - Collected and analyze the Buoy data trends
 - ABI based SST data collection over the Pacific ocean region for further study

