

# Independent validation of Sentinel 3 SST Products

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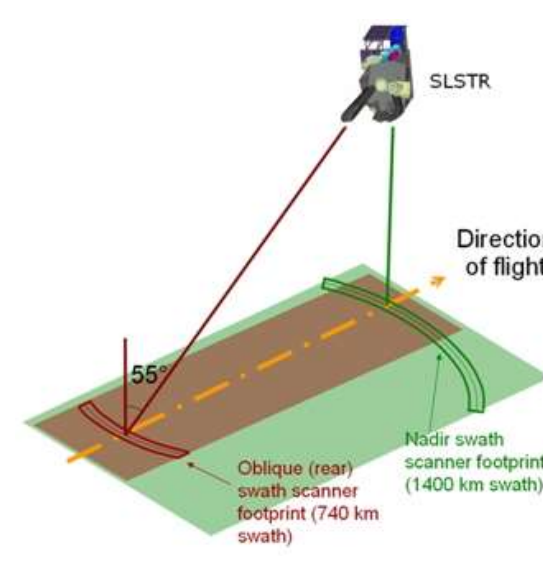
## SLSTR SST Retrievals

- Retrievals by radiative transfer modelling of the form:

$$a_0 + \sum_1^n a_n BT_n$$

where n is the number of channels

- For SLSTR we use 2 channels during day and 3 during night (3.7  $\mu\text{m}$  not used during day owing to solar contamination)
- We have two views, so we have four SST retrievals in total



Nominal Channel Centre	Primary Application
S7: 3.7 $\mu\text{m}$	SST Retrieval
S8: 11 $\mu\text{m}$	SST/LST Retrieval
S9: 12 $\mu\text{m}$	SST/LST Retrieval

### Four Possible Retrievals:

- Nadir 2-channel N2
- Nadir 3-channel N3
- Dual 2-channel D2
- Dual 3-channel D3

\* SLSTR provides SST<sub>skin</sub> \*

## Validation Methodology

- Matchup generation**
  - Matchups between SLSTR and *in situ* data generated using Felyx
  - Results shown here for drifting buoys only
- Matchup Databases**
  - Reprocessing: August 2016 to April 2018
  - NRT: April 2018 onwards
  - New format -> WST base file plus WCT, MET, RBT-a, RBT-i and RTM auxiliary files
- Post processing**
  - Fairall/Kantha-Clayson (FKC) model run for skin/depth/time adjustments

## SLSTR SST Products

- SL2\_WCT**
  - This product provides sea surface temperature for all offered retrieval algorithms.
  - Only available to Cal/Val users via ODA (FTP) and Data Centre (Archive)
- SL2\_WST**
  - This product provides the best SST at each SLSTR location in GHRSSST L2P format.
  - Available to all via ODA (FTP), EUMETCAST (DVB), CODA (http) and Data Centre (Archive)
- SLSTR-A**
  - Operational since 05/07/2017
  - Introduction of Bayesian cloud masking on 04/04/2018
  - Reprocessed data from 19/04/2016 to 04/04/2018 now available via CODA REP
- SLSTR-B**
  - In production since 17/06/2018; harmonized to SLSTR-A
  - Operational since 12/03/2019

Data quality of both sensors is very good, meeting mission requirements (accuracy < 0,3 K). Main issue is quality of cloud mask in coastal regions (updates planned).

Product notices and other useful information available from EUMETSAT Sea Surface Temperature Services webpage:

<https://www.eumetsat.int/website/home/Satellites/CurrentSatellites/Sentinel3/SeaSurfaceTemperatureServices/index.html>

\* Always apply SSES\_bias – SST depth remains SST<sub>skin</sub> after application\*

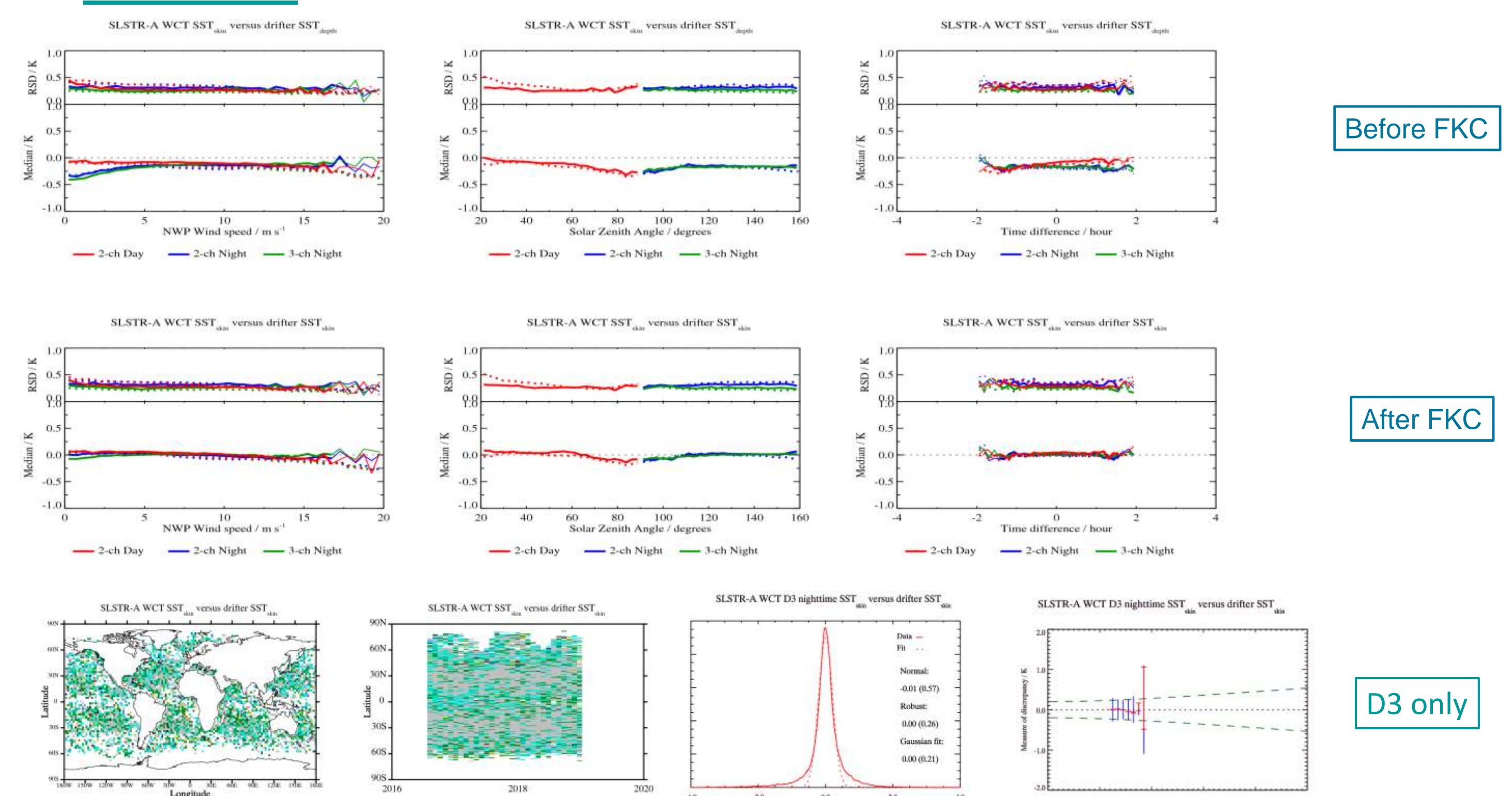
## QL Scheme

level	meaning	P(clear)	Other
0	no_data	< 0	No data; land
1	bad_data	< 0.5	T <sub>11</sub> < 260; SST < 271.15; ice detected; NWP missing
2	worst_quality	< 0.8	$\theta_{\text{sat}} > 55$
3	low_quality	< 0.9	Twilight ( $87.5 < \theta_{\text{sol}} < 92.5$ )
4	acceptable_quality		Aerosol detected: $\text{abs}(\text{ASDI}) > 0.2$
5	best_quality		

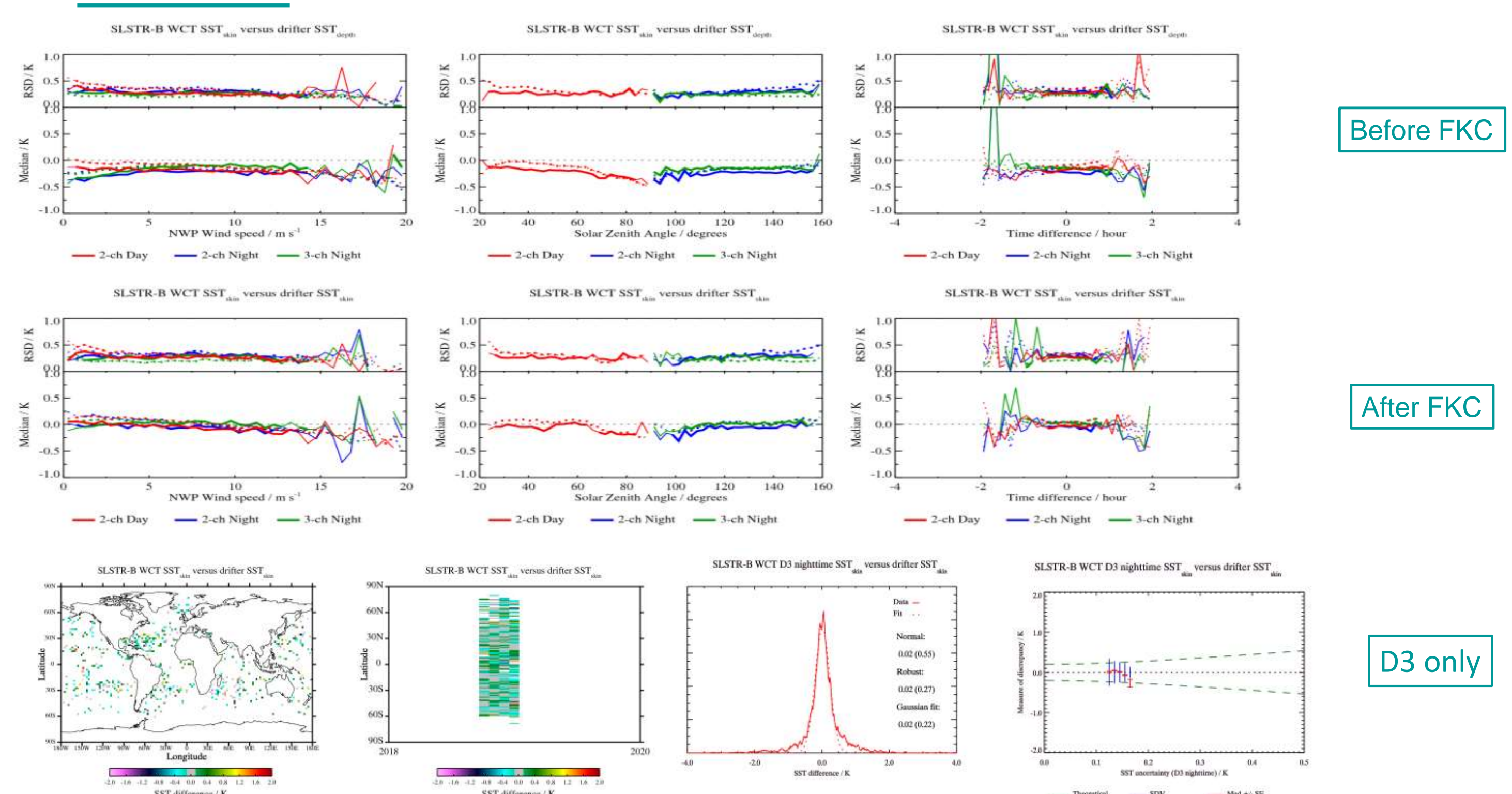
\* Do not use data with QL < 5 \*

## Validation Results

### SLSTR-A



### SLSTR-B



Colours show number of channels; solid lines indicate dual-view; dashed lines indicate nadir-only.

## SST Image Quality

All data shown – no masking applied

Both views

Nadir-only

