

## CATDS Ocean Salinity Level 3 products – Differences & Pros/Cons

|                          | CATDS CPDC  | CATDS CEC-IFREMER v2   | CATDS CEC-LOCEAN DEBIAS v5  |
|--------------------------|---|--|---|
| $T_b$                    | L1c Reconstructed on EASE2 grid ( $\geq 25\text{km}$ )  | L1b Reconstructed on EASE grid   | L1c Reconstructed on EASE2 grid ( $\geq 25\text{km}$ )  |
| SSS retrieval            | L2OS v6 (Dwell-line; iterative retrieval)<br>+: $T_b$ weighted by radiometric accuracy; wind adjusted & theoretical error estimate<br>-: complex  | SSS( $T_{bx}+T_{by}$ )<br>+: not affected by Faraday rotation<br>-: no check of dwell line consistency   | L2OS v6 (Dwell-line; iterative retrieval)<br>+: $T_b$ weighted by radiometric accuracy; wind adjusted & theoretical error estimate<br>-: complex  |
| Wind-model               | Model 1   | Model 2  | Model 1   |
| Calibration              | CSQ3 product: Variable OTT and removal of systematic SSS error (land contamination and seasonal/latitudinal bias)<br>+ CSQ3: use SMOS self consistency for systematic errors correction<br>- CSQ3: possible remaining RFI contamination | Single OTT + daily $5^\circ \times 5^\circ$ adjustment wrt SSS climato<br>+: single OTT calibration<br>-: need additional bias correction (in time and space) that mask part of interannual variability: see level 4 product for an improved bias correction (using ISAS maps) | Variable OTT and removal of systematic SSS error (land contamination and seasonal/latitudinal bias)<br>+ use SMOS self consistency for systematic errors correction<br>+ SST correction related to the use of Klein and Swift dielectric constant<br>+ ice mitigation from Acard filtering<br>+ High WS removal, improvement in the South hemisphere.<br>-: possible remaining RFI contamination<br>-: At high latitude, imperfect correction due to ice contamination: |
| Filtering                | Similar to L2OS v6 flags  | interorbit consistency / RFI %<br>+: more refined than L2OS flags  | 3 sigma self-consistency analysis<br>Error field ( $=\text{Chi}^2 \cdot \text{SSS\_error}$ )  |
| Region of FOV considered | EAFFOV ( $\pm 400\text{km}$ from swath centre)<br>+: keep large incidence angle variation ( $\Rightarrow$ better wind adjustment)<br>-: more suspicious $T_b$ in EAFFOV than in AFFOV   | AFFOV only<br>+: avoid suspicious $T_b$ in EAFFOV<br>-: reduced number of $T_b$ s  | EAFFOV ( $\sim \pm 400\text{km}$ from swath centre)<br>+: keep large incidence angle variation ( $\Rightarrow$ better wind adjustment) and numerous $T_b$ in AFFOV<br>-: more suspicious $T_b$ in EAFFOV than in AFFOV  |
| Temporal sampling        | 1 Day   | Daily, 10-days, Monthly  | 4days   |
| Grid sampling            | 25km & 50km   | $0.25^\circ$ , $0.5^\circ$ , $1^\circ$   | 25km  |
| Average                  | Simple average : 10 days, Monthly running means ; $\sim 50\text{km}$ (SMOS original spatial footprint) & $100\text{km}$<br>- no interorbit consistency check  | Simple average after thorough filtering of inconsistent SSS<br>+ interorbit consistency check  | 9day and 18 day FWHM gaussian smoothing, mean smoothing over nearest neighbors ( $\sim 70\text{km}$ effective spatial resolution)<br>+ interdwell consistency checks  |
| Format                   | Netcdf – EASE2 grid   | Netcdf – rectangular grid  | Netcdf – EASE2 grid   |
| Access                   | <a href="ftp://ext-catds-cpdc:catds2010@ftp.ifremer.fr/">ftp://ext-catds-cpdc:catds2010@ftp.ifremer.fr/</a><br>or<br><a href="http://www.catds.fr/sipad/">www.catds.fr/sipad/</a>   | <a href="ftp://ext-catds-cecos-ifremer:catds2010@ftp.ifremer.fr/">ftp://ext-catds-cecos-ifremer:catds2010@ftp.ifremer.fr/</a>  | <a href="ftp://ext-catds-cecos-ifremer:catds2010@ftp.ifremer.fr/">ftp://ext-catds-cecos-ifremer:catds2010@ftp.ifremer.fr/</a>   |

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|         |  |                         |   |
|---------|--|-------------------------|---|
| Period  | Reprocessed: Jan 2010-<br>April 2019 / Near Real time                                  | June 2010-December 2014 | January 2010-November 2020                    |
| Updated | Everyday, with a +5 days<br>delay (NRT products also<br>available with a <1 day delay) | Occasionally            | Occasionally (update foreseen<br>end of 2021) |

Acronyms:

AFFOV: AliasFree Field of View

EAFV: Extended AliasFree Field of View

ESA: European Space Agency

EASE-grid: Equal-Area Scalable Earth Grid

ISEA-grid: Icosahedron Snyder Equal Area Grid

Tb: Brightnesstemperature ; Tbx+Tby: first Stokesparameter