

1) Most common filters/processing for satellite data

Here is the numbered list of the controls made for almost all data types. For each data type, the numbered control has to apply when its cell is checked.

1. a) rejecting BUFR files which does not match any template (section 3 of BUFR file) defined in param.cfg file.
b) Rejecting observations when out of sphere.
2. Rejecting observations when date is outside the assimilation temporal window.
3. Rejecting observations when SID is missing.
4. Remapping SID.
5. Remapping sensor id.
6. Selecting Fov (lists with interlacing option) and Scl (start and jump) to keep for each platform (and ideally for each generating center because of the difference in the numbering of scanlines for some sensors).
7. Selecting channels to keep for each platform.
8. Remapping selected channels numbers.
9. Rejecting channel(/level) when needed parameter(s) is(are) missing or outside a given interval.
10. Rejecting whole observation when no valid parameters are found (parameters will be listed for each data type).

sensor	Filter/processing									
	1	2	3	4	5	6	7	8	9	10
Amsub/mhs	X	X	X		X	X	X	X	X ¹	X ²
Amsua	X	X	X	X		X	X	X	X ³	X ⁴
Hirs	X	X	X			X	X		X ⁵	X ⁶
Airs	X	X	X		X	X			X ⁷	X ⁸
Atms	X	X	X		X	X	X		X ⁹	X ¹⁰
BUFR Seviri	X	X	X		X		X	X	X ¹¹	X ¹²
Ssmis	X	X	X	X		X	X		X ¹³	X ¹⁴
Iasi	X	X	X			X	X		X ¹⁵	X ¹⁶
Cris	X	X	X			X ¹⁷	X		X ¹⁸	X ¹⁹
Gpsro	X	X							X ²⁰	X ²¹
Geowind	X	X								X ²²
Ascat	X	X								X
Ersuwi	X	X								X
kuscat	X	X								X

2) Amsub & mhs specificities

- Getting originating/operating sub-center for blacklisting.

3) Amsua specificities

- Rejecting observations when satellite zenith angle is incorrect.
- Getting originating/operating sub-center for blacklisting.

4) Hirs specificities

- Getting originating/operating sub-center for blacklisting.

5) Atms specificities

- Getting originating/operating sub-center for blacklisting.
- post bator : average of the observations (subroutine written by A. Fouilloux), need initialization of seqno@hdr in bator.

6) Iasi specificities

- Input bufr files are encoded by DSI (use the same template than the original but with less channels).

7) Cris specificities

- Input bufr files are encoded by DSI (use the same template than the original but with less channels).

8) Gpsro specificities

- Rejecting refractivity data when nb_refractivity \diamond nb_levels
- rejecting temperature data when nb_temperature \diamond nb_levels
- get height & refractivity when height \in [0,100000] and refractivity when \in [0,500].
- get temperature when \in [150,350]
- get geopotential when \in [0,80000]
- dn/dz and d2n/d2z computing

9) Geowind

- Mapping with ODB's comp_method ID
- Mapping BUFR's quality indicators (whose the positions depending on the BUFR templates) with ODB's quality indicators definitions (qi_fc, rff, qi_nofc)
- Rejection if BUFR template not identified, BUFR template defined by satid and by producer

Météo-France : filters & processings used in BATOR (based on CY38t1_op1)

code

- If more than one frequency per comp_method, comp_method ID is updated in satobfreq_bynam.F90 routine (comp_method ID is then function of the frequency, and the frequencies list by satellites groups (maximum 10 groups) may be updated by namelist (for operational purposes))
- wind inversion done.

10) **Ascat**

- Note: support Eumetsat L1B product (wind block not informed in the BUFR file and wind inversion done in mkcmarpl part), OSI-SAF (KNMI) L2B product (wind block informed, operational use) and this latter product as one L1B product (wind informations not saved in ODB, wind inversion done in mkcmarpl part).
- Rejection if grid resolution in the BUFR file is different of the specified grid (may be specified by namelist, default value 25000. in meters)
- Rejection if the cell number (cross-track position) in the BUFR file is outside of the range of the cell numbers for the known grid resolutions (cell number outside [1,42] for 25000. meters grid, outside [1,82] for 12500. meters grid) or if the grid resolution is unknown then rejection
- Rejection if wind direction outside range in degrees [0.,360.] or if wind speed is outside range in m/s [0.,50.]
- Rejection if wind solution rank is above of the number of permitted solutions (note: wind solution rank may be reordered, first the most likelihood, then the most opposite in direction, then the others in the same order as in the BUFR file, reordering under key, tuning by namelist (cy40 onwards), else the order is that in the BUFR file
- Aborting if number of wind solutions in the BUFR file > 144

11) **Ersuwi**

- Note: support ESA product, wind inversion done in mkcmarpl part, decoding no longer operational since the decommissioning of ERS-2 in 2011
- None specific rejection made

12) **Kuscat**

- Note: support OSI-SAF (KNMI) L2B product
- Note: Wind solutions may be reordered, first the most likelihood, then the most opposite in direction, then the others in the same order as in the BUFR file, reordering under key, tuning by namelist (cy40 onwards), else the order is that in the BUFR file
- Rejection if wind direction outside range in degrees [0.,360.] or if wind speed is outside range in m/s [0.,50.]
- Note: control on the grid resolution (informed in the BUFR file, both in x and y directions) and the cell number (cross-track position) may be checked, as for Ascat data. Currently, only one grid resolution is available (50km x 50km), cell numbers inside [1,36]

Météo-France : filters & processings used in BATOR (based on CY38t1_op1)

- Aborting if number of wind solutions in the BUFR file > 144

13) Qscat

- Note: support home-made inversion product (prescat task) and OSI-SAF (KNMI) L2B product. Decoding no longer operational since the failure of the instrument in 2009
- Other items are as for Kuscat

- (1) When $T_b \notin [100^\circ\text{K}, 350^\circ\text{K}]$.
- (2) If no valid T_b parameter.
- (3) When $T_b \notin [100^\circ\text{K}, 350^\circ\text{K}]$.
- (4) If no valid T_b parameter.
- (5) When $T_b = \text{RABSI}$
- (6) If no valid T_b parameter.
- (7) When $T_b \notin [150^\circ\text{K}, 350^\circ\text{K}]$.
- (8) When number of channels < 324 , or cloud cover $\in]5\%, 100\%[$, or when at least one T_b is incorrect (see previous note).
- (9) When $T_b \notin [85^\circ\text{K}, 330^\circ\text{K}]$.
- (10) When number of channels < 22 , or if there is no valid T_b parameter.
- (11) When $T_b \notin [150^\circ\text{K}, 350^\circ\text{K}]$.
- (12) When at least one T_b is incorrect, or when satellite zenith angle $\geq 75^\circ$.
- (13) When T_b or channel number is missing.
- (14) If no valid T_b parameter.
- (15) When $T_b \notin [150^\circ\text{K}, 350^\circ\text{K}]$.
- (16) When number of channel < 314 , or when QF is bad (with old template, QF for band 1 or 2 is bad with new template), or when satellite zenith angle $\geq 75^\circ$, or when at least one T_b (in band 1 or 2) is incorrect.
- (17) FOR is needed for FOV.
- (18) When $T_b \notin [150^\circ\text{K}, 350^\circ\text{K}]$.
- (19) When number of channel < 331 , or when at least one T_b (in band 1 or 2) is incorrect.
- (20) Rejecting level when there is no mean frequency, or impact parameter $\notin [6200000, 6600000]$, or bending angle $\notin]0, 0.06[$.
- (21) Reject the whole profile when :
confidence $< 100\%$, profile marked as bad (either at top level, or during bending angle processing, or during excess phase processing), profiles which are in fact "background", number of levels $\notin [1, 300[$, geoid undulation > 200 , Earth radius curvature $\notin [6250000, 6450000]$. the profile is also rejected if 'tangent point drift' option is activated and at least one level is out of sphere.
- (22) When SID and comp_method (channel, OMM ID) is unknown, or pressure level is missing, or when an incorrect wind is found, or when wind direction $\notin [0^\circ, 360^\circ]$, or when wind speed is missing.