argo data management

Argo data management
DOI: https://doi.org/10.13155/62466

Quality control for Biogeochemical-Argo radiometry

Version 1.0
July 1st 2019

ARGO
part of the integrated global observation strategy

Argo data management
Quality control for Bio-Argo radiometry

Authors: Antoine Poteau, Emanuele Organelli, Emmanuel Boss, Xiaogang Xing

How to cite this document

Antoine Poteau, Emanuele Organelli, Emmanuel Boss, Xiaogang Xing (2019). **Quality control for Biogeochemical Argo radiometry**. https://doi.org/10.13155/62466

Table of contents

History of the document

Version	Date	Authors	Modification
1.0	July 2019	Antoine Poteau, Emanuele Organelli, Emmanuel Boss, Xiaogang Xing	Initial version with RT QC for irradiance and PAR

1 Introduction

This first version of the document is to apply an initial QC to all radiometry values. Except for data failing the following tests, all the other values will be flagged as probably good data (‘2’). Probably good data need to be validated (i.e., flagged as good “1”) in delayed mode.

2 Real Time QC test : Global range Test

This test applies a gross filter on each observed value for DOWN_IRRADIANCExxx and DOWNWELLING_PAR vertical profiles.
Minimal values are set to -1 for all variables.
Maximal values are specific to each variable and represent the maximum value that is expected on the Earth, at the ocean surface under clear sky, regardless of the time of the year. These values have been derived from the theoretical model by Gregg and Carder (1990). These values have been finally multiplied by 2 to remove also additional effects on radiometric values such as the wave focusing. The values used to test radiometric quantities are listed in Table 1.

The official BGC-Argo unit for:
• DOWN_IRRADIANCE is W.m-2 .nm-1
• DOWNWELLING_PAR is µmolQuanta.m-2 .s-1

	Min	Max
DOWN_IRRADIANCE380	-1	1.7
DOWN_IRRADIANCE412	-1	2.9
DOWN_IRRADIANCE443	-1	3.2
DOWN_IRRADIANCE490	-1	3.4
DOWNWELLING_PAR	-1	4672

Table 1 : Range values of the global range test.

ACTION: If a value fails this test, it should be flagged as bad data (‘4’).

The global range test has been applied on the GDAC database on July 25, 2019. Here the results:
this QC has removed bad radiometric values on 25 WMO of the 186 WMO floats with PARAM DOWN_IRRADIANCExxx and/or DOWNWELLING_PAR (Table 2; Table 3).

PARAMETER	NB VALUE	NB VALUE QC=2	% QC=4	MIN before QC	MAX before QC	MIN after QC	MAX after QC
DOWN_IRRADIANCE380	8892018	8889437	0,03%	-4,6196	4,3118	-0,9541	1,4148
DOWN_IRRADIANCE412	9107436	9049007	0,64%	-6,7893	6,3650	-0,8021	2,6241
DOWN_IRRADIANCE443	215418	215418	0,00%	-0,0021	2,7591	-0,0021	2,7591
DOWN_IRRADIANCE490	9107436	9060517	0,52%	-17228304	298833215488	-0,9989	3,1826
DOWNWELLING_PAR	9107436	9025518	0,90%	-10812	4236	-1,0000	4236

Table 2 : The impact of the global test range on the global radiometric database on July 25, 2019.

DAC	WMO	PI	Nb	DOWN_IRRADIANCE380	DOWN_IRRADIANCE412	DOWN_IRRADIANCE443	DOWN_IRRADIANCE490	DOWNWELLING_PAR
bodc	3901497	Giorgio Dall'Olmo	138600	3 -	3 -	-	3 -	3 -
coriolis	4901805	Marcel Babin	28023	1 -	1 -	-	1 -	1 -
coriolis	6901004	Herve CLAUSTRE	92903	- 4	-	-	-	1 -
coriolis	6901439	Herve CLAUSTRE	125465	298 -	296 -	-	296 -	298 -
coriolis	6901473	Herve CLAUSTRE	121005	2233 -	2313 -	-	2232 -	2233 -
coriolis	6901475	Herve CLAUSTRE	26917	17 -	17 -	-	29 -	29 -
coriolis	6901489	Fabrizio D'ORTENZIO	30097	-	-	-	-	19107 -
coriolis	6901514	Herve CLAUSTRE	10459	-	-	-	-	7013 -
coriolis	6901518	Herve CLAUSTRE	26169	-	-	-	-	17699 -
coriolis	6901522	Fabrizio D'ORTENZIO	1626	-	-	-	-	1102 -
coriolis	6901526	Fabrizio D'ORTENZIO	5943	-	-	-	-	4180 -
coriolis	6901653	Pascal CONAN	67133	5 -	5 -	-	110 -	110 -
coriolis	6901766	Fabrizio D'ORTENZIO	60896	2 1	-	-	-	1 -
coriolis	6901860	Pierre-Marie POULAIN	19095	-	19095 -	-	19095 -	19095 -
coriolis	6901866	Pierre Marie Poulain	137170	-	3 -	-	8 -	8 -
coriolis	6902666	Marcel Babin	18040	-	-	-	-	11020 -
coriolis	6902671	Marcel Babin	36685	-	- 36685	-	-	-
coriolis	6902734	Herve Claustre	82327	-	1 -	-	1 -	7 -
coriolis	6902737	Herve Claustre	91525	1 3	-	-	-	1 -
coriolis	6902740	Herve Claustre	31161	2 2	-	-	-	1 -
coriolis	6902896	Marcel Babin	28515	1 -	1 -	-	1 -	1 -
coriolis	6902901	Laurent Coppola	18145	-	1 -	-	-	-
coriolis	6902909	Elodie Martinez	18494	-	-	-	3218 15276	-
coriolis	6902953	Marcel Babin	3953	5 -	5 -	-	6 -	5 -
coriolis	6902969	Herve Claustre	10857	1 -	1 -	-	1 -	1 -

Table 3 : 25 WMO impacted by the range test in July 25, 2019

3 References

1. Gregg, W.W. and K.L. Carder, 1990. A simple spectral solar DOWN_IRRADIANCE model for cloudless maritime atmospheres. Limnology and Oceanography 35: 1657-1675.