Surface Pressure of PROVOR/ARVOR floats based on Coriolis GDAC at 19/09/2012

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Summary

In this report, we check the surface pressure of the Argo PROVOR-ARVOR fleet to detect drift and problems of the pressure sensors. For each DAC and for each float model, we count how many floats have surface pressure (SP) that exeeds 5dB (absolute value). Negative drift are associated with microleak of the Druck pressure sensor. Surface pressure problems at the end of the life of the float might be related to the "snowflakes" problem. Other surface pressure problems occur and part of them might be related to decoding problems (jump,shift,..)
For the Coriolis DAC we find that :

- 16 (15.1%) PROVOR FSI have surface pressure that exeed +/-5dB. Most of them (11/16) have surface pressure that reach large value (up to +31dB) at the end of the float life. One of them has surface pressure that jumps from 4 to -46dB. This could be related to decoding problems
- 7 (4.9%) PROVOR CTS2 have a negative surface pressure drift.
- 3 (1.1%) PROVOR CTS3 have a negative surface pressure drift.
- 2 PROVOR CTS3 with a negative drift are active floats (1901173 and 4901255)
- 3 ARVOR-A3 have surface pressure that switch between 0 and -6dB. This could be related to decoding problems

1 Number of PROVOR/ARVOR by DACs

DAC	bodc	coriolis	csio	csiro	incois	jma	kma	kordi	meds	nmdis
Number of PROVOR/ARVOR	26	667	22	6	29	209	13	0	3	19
No TECH file or empty SP values	2	29	2	1	5	6	1	26	30	0
With max(abs(PRES)) $\geq 5dB$	1	33	11	0	5	26	4	0	0	5

Tab. 1: Number of PROVOR/ARVOR by DACs

2 CORIOLIS

2.1 Technical parameter names

It was recently found out that the surface pressure transmitted by the French PROVOR CTS3, PROVOR-DO and ARVOR have been wrongly interpreted. It was tough to be a relative offset, but this is a cumulative offset. Moreover, the value transmitted is equal in magnitude but opposite direction of the current pressure reading. For example, in case of a micro-leak problem with a negative surface pressure offset, the transmitted value will be positive. There are no consequences on the profile pressures because they are auto-corrected. However, the surface pressure technical names for French PROVOR CTS3, PROVOR-DO and ARVOR (`PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR` and `PRES_SurfaceOffsetBeforeReset_1cBarResolution_dBAR`) have been changed to : `PRES_SurfaceOffsetCorrectedNotResetNegative_1dBarResolution_dBar` and `PRES_SurfaceOffsetCorrectedNotResetNegative_1cBarResolution_dBar`

Technical parameter names to check

6900800, PRES_SurfaceOffsetCorrectedNotReset_1dBarResolution_dBAR, Pierre Marie POULAIN, MEDARGO_IT, ARVOR IRIDIUM, OIN−10−IT−ARI−02, 844
3900997, PRES_SurfaceOffsetBeforeReset_1cBarResolution_dBAR, Yves GOURIOU, CORIOLIS, PROVOR CTS3, OIN−05−S3−78, 841
3900995, PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR, C. PROVOST et N. BARRE, CORIOLIS, PROVOR CTS3, PROVOR CTS3 05−S3−75, 841
3900996, PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR, PROVOR CTS3, PROVOR CTS3 05-S3-76, 841, C. PROVOST et N. BARRE, CORIOLIS

2.2 Surface pressures

The surface pressure available in the technical files has been controlled the 19/09/2012. Surface pressure with max(abs(PRES))$\geq$ 5dB have been visually checked.

Float models	number of floats	with +/-5db	Comments
ARVOR (SBE)	62	0	
ARVOR IRIDIUM (SBE)	8	0	
ARVOR-A3 (SBE)	4	3	Switch between 0 and -6dB (3)
ARVOR-L (SBE)	9	0	
PROVOR T (NO PSAL)	35	0	
PROVOR 1 (NO PSAL)	2	0	
PROVOR (FSI)	1	1	Jump 4 to -46dB (1)
PROVOR CT (FSI)	5	2	Positive drift (1) Shift (1)
PROVOR CTF2 (FSI)	62	8	End of life problems (7) Peak (1)
PROVOR CTF3 (FSI)	38	5	End of life problems (4) Shift (1)
PROVOR (SBE)	17	0	
PROVOR CTS2 (SBE)	168	11	Positive drift (1) Negative drift (7) Peak (3)
PROVOR CTS3 (SBE)	169	5	Negative drift (3) Peak (2)
PROVOR CTS3 4.82 (SBE)	20	0	
PROVOR CTS3 BT (SBE)	3	0	
PROVOR CTS3 DO (SBE)	18	0	
PROVOR CTS3 DO 9 (SBE)	15	0	
PROVOR CTS3 v4.8 (SBE)	6	0	
PROVOR CTS3-DO (SBE)	24	0	
PROVOR CTS3-DO 9 (SBE)	1	0	
PROVOR CTS3-DO B (SBE)	1	0	
PROVOR CTS3_4.84 (SBE)	1	0	
PROVOR BIOARGO (SBE)	1	0	

Tab. 2: Number of PROVOR/ARVOR by float models, CORIOLIS

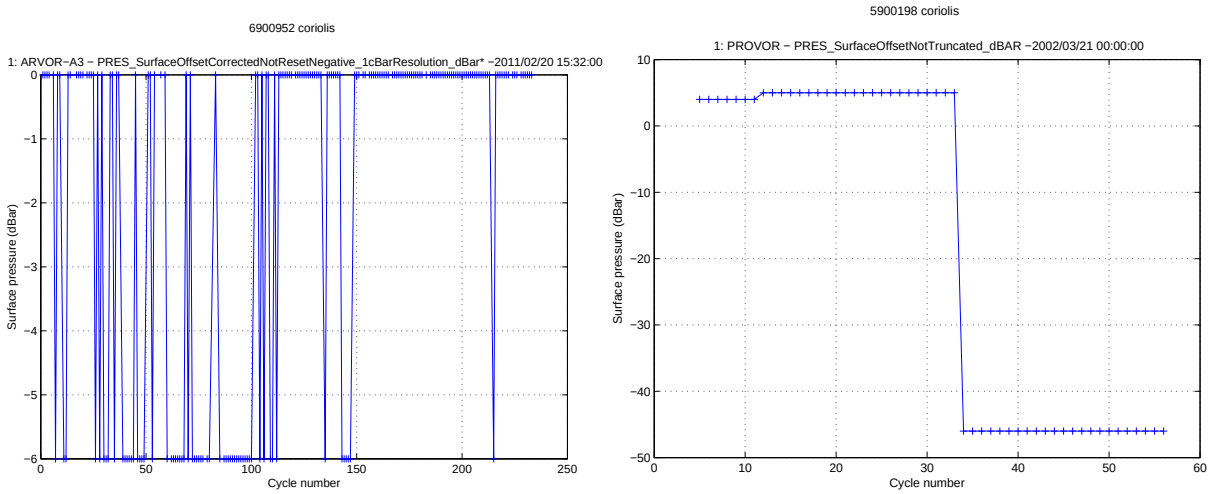

FIG. 1: Surface pressure for float 6900952(left) 5900198 (right)

ARVOR A3 with SP that switch between 0 and +6dB : decoding problem ?(ex : Figure 1)
6900947, ARVOR-A3, OIN-10-AR-A3-01, 844, Pierre Marie POULAIN, MEDARGO_IT
6900952, ARVOR-A3, OIN-10-AR-A3-02, 844, Pierre Marie POULAIN, MEDARGO_IT, ACTIVE
6900998, ARVOR-A3, OIN-10AR-A3-03, 844, Pierre Marie POULAIN, NAOS, ACTIVE

PROVOR (FSI) with SP that jumps from 4 to -46dB : decoding problem ?(ex : Figure 1)
5900198, PROVOR (FSI), PROVOR, 842, Liu ZENGHONG, I-P-Study

PROVOR (FSI) with SP a shift (ex : Figure 2)
69043, PROVOR CT (FSI), PROVOR XXXX, 842, Christine COATANOAN, POMME
1900080, PROVOR CTF3 (FSI), PROVOR Profiling Float, 842, Christine COATANOAN, CORIOLIS

PROVOR (FSI) with SP positive drift
69044, PROVOR CT (FSI), PROVOR XXXX, 842, Christine COATANOAN, POMME

PROVOR (FSI) with SP peaks
6900046, PROVOR CTF2 (FSI), PROVOR Profiling Float PV CT OIN-00-02-30, 842, Virginie THIERRY, GYROSCOPE

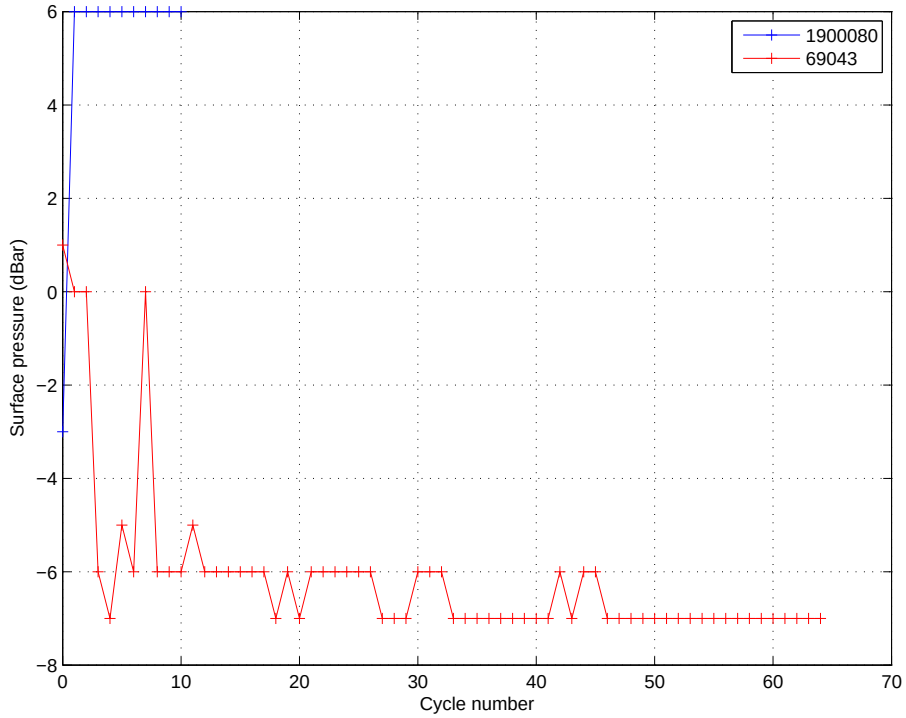

FIG. 2: PROVOR FSI with shifts

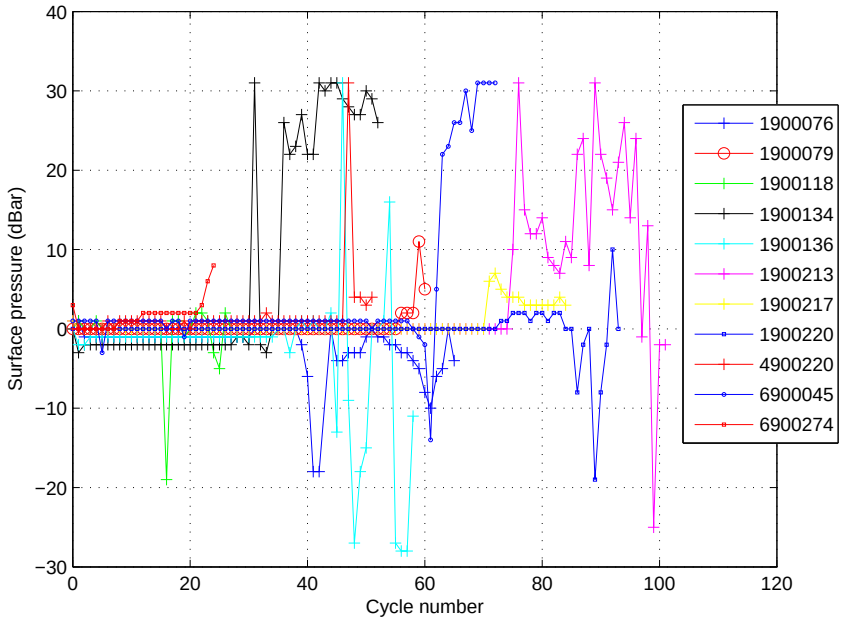

FIG. 3: PROVOR FSI with problems at the end of life

PROVOR (FSI) with problems at the end of life (ex : Figure 3)

1900076, PROVOR CTF2 (FSI), PROVOR Profiling Float CT PV13, 842, Virginie THIERRY, GYROSCOPE
1900079, PROVOR CTF2 (FSI), PROVOR Profiling Float CT PV40, 842, Virginie THIERRY, GYROSCOPE
1900118, PROVOR CTF2 (FSI), PROVOR Profiling Float CTF2, 842, Christine COATANOAN, CORIOLIS
1900134, PROVOR CTF2 (FSI), PROVOR-CT OIN-01-F2-57 PV057, 842, Rosemary MORROW, FLOSTRAL
1900136, PROVOR CTF2 (FSI), PROVOR-CT OIN-01-F2-59 PV059, 842, Rosemary MORROW, FLOSTRAL
4900220, PROVOR CTF2 (FSI), PROVOR-CT PV OIN-00-00-28, 842, Virginie THIERRY, GYROSCOPE
6900045, PROVOR CTF2 (FSI), PROVOR Profiling Float PV CT OIN-00-02-38, 842, Virginie THIERRY, GYROSCOPE
1900213, PROVOR CTF3 (FSI), PROVOR Profiling Float OIN-01-F2-071, 842, Bernard BOURLES, ETO_BB
1900217, PROVOR CTF3 (FSI), PROVOR Profiling Float OIN-01-F2-075, 842, Bernard BOURLES, ETO_BB
1900220, PROVOR CTF3 (FSI), PROVOR Profiling Float OIN-01-F2-079, 842, Bernard BOURLES, ETO_BB
6900274, PROVOR CTF3 (FSI), PROVOR Profiling Float OIN-01-F2-228, 842, Virginie THIERRY, OVIDE

PROVOR (SBE) with SP peaks

6900238, PROVOR CTS2 (SBE), PROVOR Profiling Float OIN-01-S2-025 PV025, 841, Virginie THIERRY, OVIDE
6900384, PROVOR CTS2 (SBE), PROVOR CTS XXXX, 841, Andreas STERL, DAP
6900386, PROVOR CTS2 (SBE), PROVOR Profiling Float CTS2 XXXX, 841, Andreas STERL, DAP

PROVOR (SBE) with SP positive drift

1900319, PROVOR CTS2 (SBE), PROVOR-CTS2-4.1 OIN-03-S2-08, 841, Rosemary MORROW, FLOSTRAL

PROVOR (SBE) with SP negative drift

1900379, PROVOR CTS2 (SBE), PROVOR Profiling Float CTS2 XXXX, 841, Daniel Ballestero, ARGO_CR
3900788, PROVOR CTS2 (SBE), PROVOR CTS2 05-S2-62, 841, Gerard ELDIN, FLOPS
5900901, PROVOR CTS2 (SBE), PROVOR Profiling Float CTS2 04-S2-21, 841, Thierry DELCROIX, FRONTALIS
5900902, PROVOR CTS2 (SBE), PROVOR Profiling Float CTS2 04-S2-22, 841, Thierry DELCROIX, FRONTALIS

5900905, PROVOR CTS2 (SBE), PROVOR Profiling Float CTS2 04-S2-25, 841, Thierry DELCROIX, FRONTALIS
6900291, PROVOR CTS2 (SBE), PROVOR CTS2 Profiling Float PV999, 841, Pierre POULAIN, MFSTEP
6900292, PROVOR CTS2 (SBE), PROVOR CTS2 Profiling Float PV999, 841, Pierre POULAIN, MFSTEP
1901092, PROVOR CTS3 (SBE), PROVOR CTS3 07-S3-35, 841, Christine COATANOAN, CORIOLIS
1901173, PROVOR CTS3 (SBE), OIN-08-S3-012, 841, Fabien ROQUET, TRACK , ACTIVE
4901255, PROVOR CTS3 (SBE), PROVOR CTS3 07-S3-41, 841, Christine COATANOAN, CORIOLIS, ACTIVE

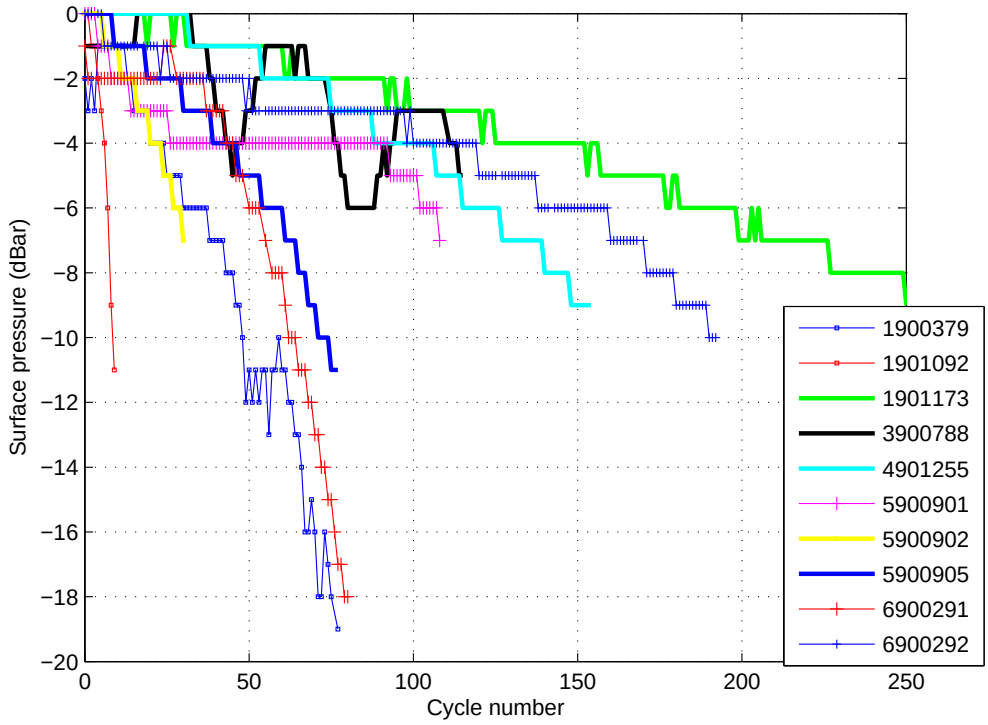

FIG. 4: Coriolis floats with negative drifts

3 BODC

Float models	number of floats	with +/-5db	Comments
MARTEC-FSI	21	1	positive drift
MARTEC-SBE	5	0	

Tab. 3: Number of PROVOR/ARVOR by float models, BODC

4 CSIO

4.1 Technical parameter names

Technical parameter names to check

2901505, PRES_SurfaceOffsetBeforeReset_1cBarResolution_dBar, ARVOR, OIN-10CH-AR-10, 844, Jianping Xu, ARGO CHINA
5900318, PRESSURE_OFFSET_(DBAR), PROVOR_SBE, PROVOR_SBE_MT098, 841, Jianping Xu, CHINA ARGO PROJECT
5900317, PRESSURE_OFFSET_(DBAR), PROVOR_SBE, PROVOR_SBE_MT097, 841, Jianping Xu, CHINA ARGO PROJECT
5900316, PRESSURE_OFFSET_(DBAR), PROVOR_SBE, PROVOR_SBE_MT096, 841, Jianping Xu, CHINA ARGO PROJECT
5900315, PRESSURE_OFFSET_(DBAR), PROVOR_SBE, PROVOR_SBE_MT095, 841, Jianping Xu, CHINA ARGO PROJECT
5900228, PRESSURE_OFFSET_(DBAR), PROVOR_SBE, PROVOR_SBE_MT094, 841, Jianping Xu, CHINA ARGO PROJECT
5900220, PRESSURE_OFFSET_(DBAR), PROVOR_SBE, PROVOR_SBE_MT102, 841, Jianping Xu, CHINA ARGO PROJECT
2900313, PRESSURE_OFFSET_(DBAR), PROVOR_SBE, PROVOR_SBE_MT138, 841, Jianping Xu, CHINA ARGO PROJECT
5900219, PRESSURE_OFFSET_(DBAR), PROVOR_SBE, PROVOR_SBE_MT136, 841, Jianping Xu, CHINA ARGO PROJECT
2900458, PRESSURE_OFFSET_(CBAR), PROVOR_SBE, PROVOR_SBE_MT015, 841, Jianping Xu, CHINA ARGO PROJECT
2900457, PRESSURE_OFFSET_(CBAR), PROVOR_SBE, PROVOR_SBE_MT014, 841, Jianping Xu, CHINA ARGO PROJECT

4.2 Surface Pressure

PROVOR_SBE with SP around 100 dB : decoding problem ? (ex : Figure 5)

5900318, 5900317, 5900316, 5900315, 5900228, 5900220, 2900313

PROVOR_SBE with SP around 560 cB (ex : Figure 6)

5900219, 2900458, 2900457

Float models	number of floats	with +/-5db	Comments
ARVOR (SBE)	10	0	
PROVOR_SBE (NO PSAL)	1	1	Peak (1)
PROVOR_SBE (SBE)	11	10	Values around 100dB (7)
			values aroud 560 cBar (3)

Tab. 4: Number of PROVOR/ARVOR by float models, Csio

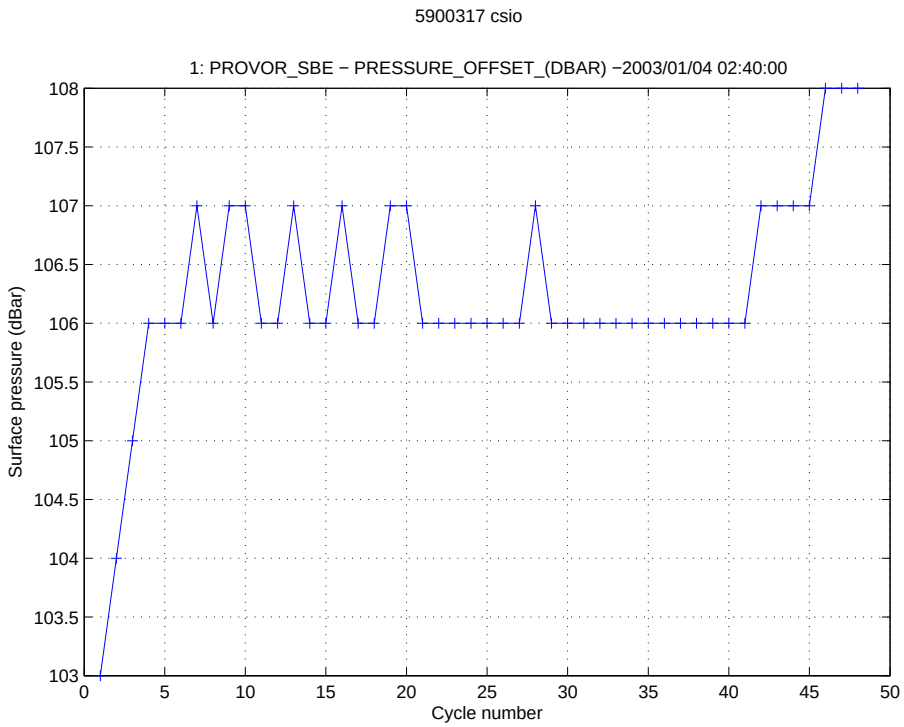

Fig. 5: Surface pressure for float 5900317

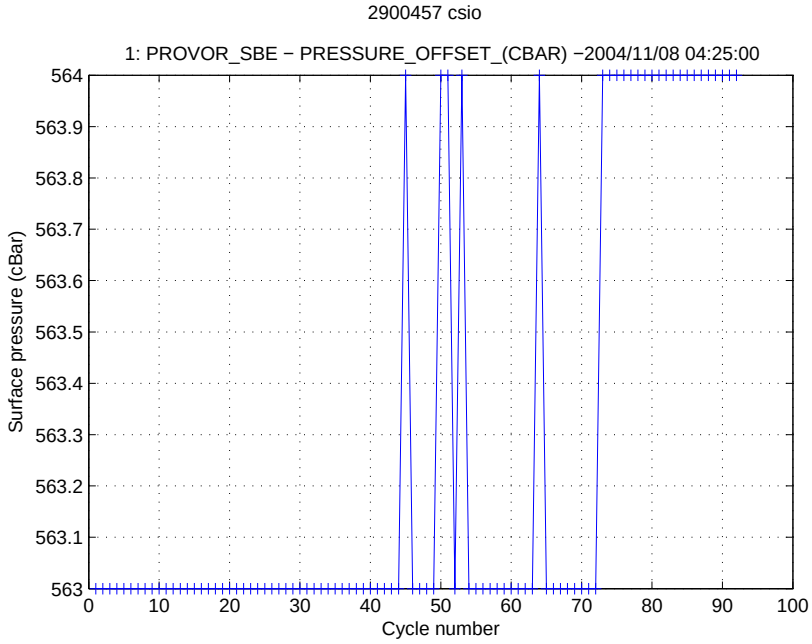

FIG. 6: Surface pressure for float 2900457

5 CSRIO

Float models	number of floats	with +/-5db	Comments
PROVOR	6	0	

Tab. 5: Number of PROVOR/ARVOR by float models,CSIRO

6 INCOIS

6.1 Technical parameter names

Technical parameter names to check

2901316, PRES_SurfaceOffsetBeforeReset_1cBarResolution_dBar, PROVOR CTS3, XXXX, 841, M Ravichandran, Indian ARGO
2901284, PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR, PROVOR, PROVOR 0, 841, M Ravichandran, Indian ARGO

6.2 Surface Pressure

Float models	number of floats	with +/-5db	Comments
PROVOR (SBE)	20	5	Values between 0 and +7dB (2) Values between -3dB and -6dB (3)
PROVOR CTS3 (SBE)	7	0	
PROVOR_FSI (FSI)	2	0	

Tab. 6: Number of PROVOR/ARVOR by float models, Incois

PROVOR (SBE) Values between -3dB and -6dB

1900122, PROVOR (SBE), PROVOR 88, 841, M Ravichandran, Indian ARGO
2900235, PROVOR (SBE), PROVOR 87, 841, M Ravichandran, Indian ARGO
2900232, PROVOR (SBE), PROVOR 84, 841, M Ravichandran, Indian ARGO

PROVOR (SBE) Values between 0 and +7dB

2900233, PROVOR (SBE), PROVOR 85, 841, M Ravichandran, Indian ARGO
2900234, PROVOR (SBE), PROVOR 86, 841, M Ravichandran, Indian ARGO

7 JMA

7.1 Technical parameter names

We found surface pressure names `PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBar` and `PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBar` for number of ARVOR and PORVOR-CTS3 floats. Is it correct ? ?

7.2 Surface Pressure

Float models	number of floats	with +/-5db	Comments
ARVOR-SBE (SBE)	50	0	
POPS-PROVOR-SBE (SBE)	1	0	
PROVOR-SBE (SBE)	149	25	Positive drift (5) Negative drift (8) End of life problems (2) Values around 50dB (3) Peak (5) Shift (2)
PROVOR-SBE CTS-3 (SBE)	14	1	Peak (1)

Tab. 7: Number of PROVOR/ARVOR by float models, jma

Float with wrong SP values at cycle 256
`2901039 (cy 256/337), 2901050 (cy 256 puis 311/324), 2901040 (cy 256), 2901044 (cy 256), 2901046 (cy 256 323 329), 2901047 (cy 256 260 264), 2901048 (cy 256)`

PROVOR-SBE with SP values around 50dB, decoding problem ? ex Fig 7
`7900010, 7900023, 2900186`

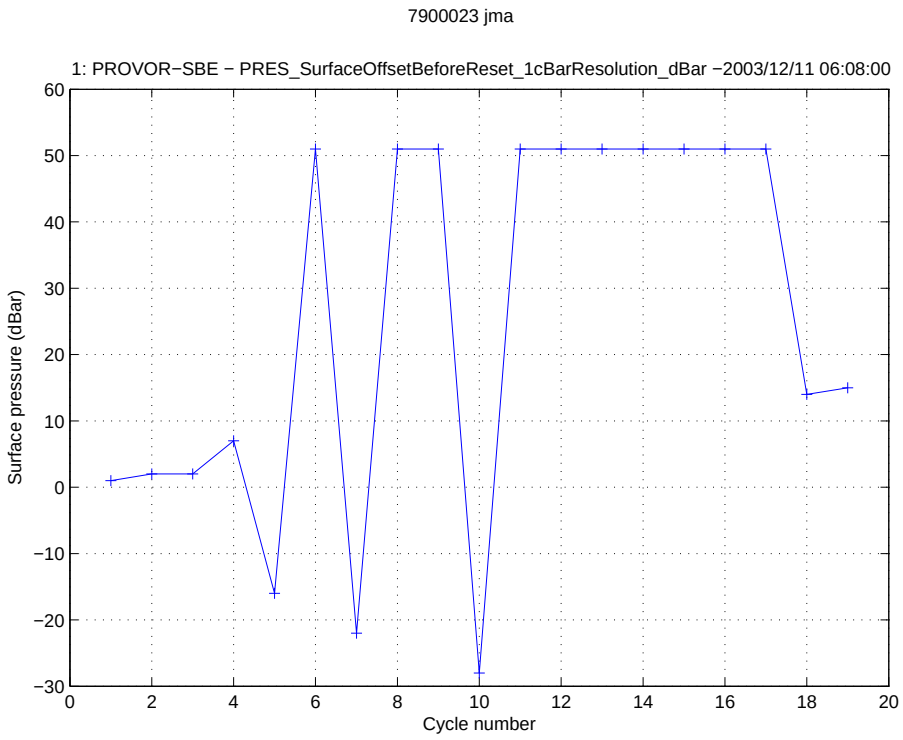

FIG. 7: Surface pressure for float 7900023

8 KMA

8.1 Technical parameter names

All the KMA ARVOR floats have surface pressure named `PRES_SurfaceOffsetBeforeReset_1cBarResolution_dBAR` in the TECH files.

8.2 Surface Pressure

Float models	number of floats	with +/-5db	Comments
ARVOR	14	5	Switch between 0 and +6dB (5)

TAB. 8: Number of PROVOR/ARVOR by float models, kma

ARVOR with SP that switch between 0 and +6dB (ex : Figure 8)

```
2901243, ARVOR, ARVOR 4166, 846, Sang-Boom Ryoo, Argo METRI KMA
2901244, ARVOR, ARVOR 4247, 846, Sang-Boom Ryoo, Argo METRI KMA
2901247, ARVOR, ARVOR 4280, 846, Sang-Boom Ryoo, Argo METRI KMA
2901248, ARVOR, ARVOR 4281, 846, Sang-Boom Ryoo, Argo METRI KMA
2901251, ARVOR, ARVOR 4284, 846, Sang_Buem Ryoo, Argo METRI KMA
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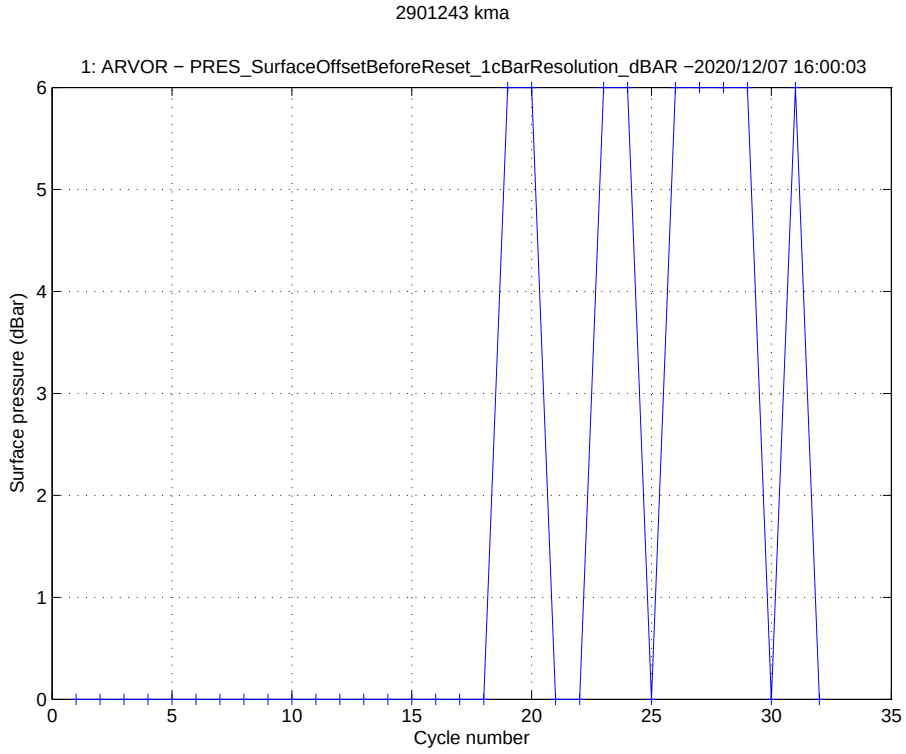

FIG. 8: Surface pressure for float 2901243

9 MEDS

9.1 Technical parameter names

Technical parameter names to check

4900423,PRES_SurfaceOffsetTruncatedplus5dbar_dBAR, PROVOR-SBE, Metocean,PROVOR-SBE,MT-103, 841, Howard Freeland, Canadian Argo

9.2 Surface Pressure

Float models	number of floats	with +/-5db	Comments
PROVOR-SBE	3	0	

Tab. 9: Number of PROVOR/ARVOR by float models, meds

10 NMDIS

10.1 Technical parameter names

Technical parameter names to check

2901615,PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR, PROVOR CTS3, OIN-08CH-S3-015, 841, Fengying Ji, Argo China SOA
2901618,PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR, PROVOR CTS3, OIN-08CH-S3-018, 841, Fengying Ji, Argo China SOA
2901619,PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR, PROVOR CTS3, OIN-08CH-S3-019, 841, Jianqing Zhou, China NMDIS
2901622,PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR,PROVOR CTS3, OIN-08CH-S3-022, 841, Fengying Ji, Argo China SOA
2901627, PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR,PROVOR CTS3, OIN-08CH-S3-027, 841, Fengying Ji, Argo China SOA
2901631,PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR, PROVOR CTS3, OIN-08CH-S3-031, 841, Fengying Ji, Argo China SOA
2901632,PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR, PROVOR CTS3, OIN-08CH-S3-032, 841, Fengying Ji, Argo China SOA
2901633,PRES_SurfaceOffsetBeforeReset_1dBarResolution_dBAR, PROVOR CTS3, OIN-08CH-S3-033, 841, Fengying Ji, Argo China SOA

10.2 Surface Pressure

Float models	number of floats	with +/-5db	Comments
PROVOR CTS3 (SBE)	19	8	Negative drift (1) Shift (2) Values at 63dB (5)

Tab. 10: Number of PROVOR/ARVOR by float models, nmdis

PROVOR CTS3 with SP values at 63dB (ex : Figure 9)

2901615, PROVOR CTS3 (SBE), OIN-08CH-S3-015, 841, Fengying Ji, Argo China SOA

2901622, PROVOR CTS3 (SBE), OIN-08CH-S3-022, 841, Fengying Ji, Argo China SOA
2901631, PROVOR CTS3 (SBE), OIN-08CH-S3-031, 841, Fengying Ji, Argo China SOA
2901632, PROVOR CTS3 (SBE), OIN-08CH-S3-032, 841, Fengying Ji, Argo China SOA
2901633, PROVOR CTS3 (SBE), OIN-08CH-S3-033, 841, Fengying Ji, Argo China SOA

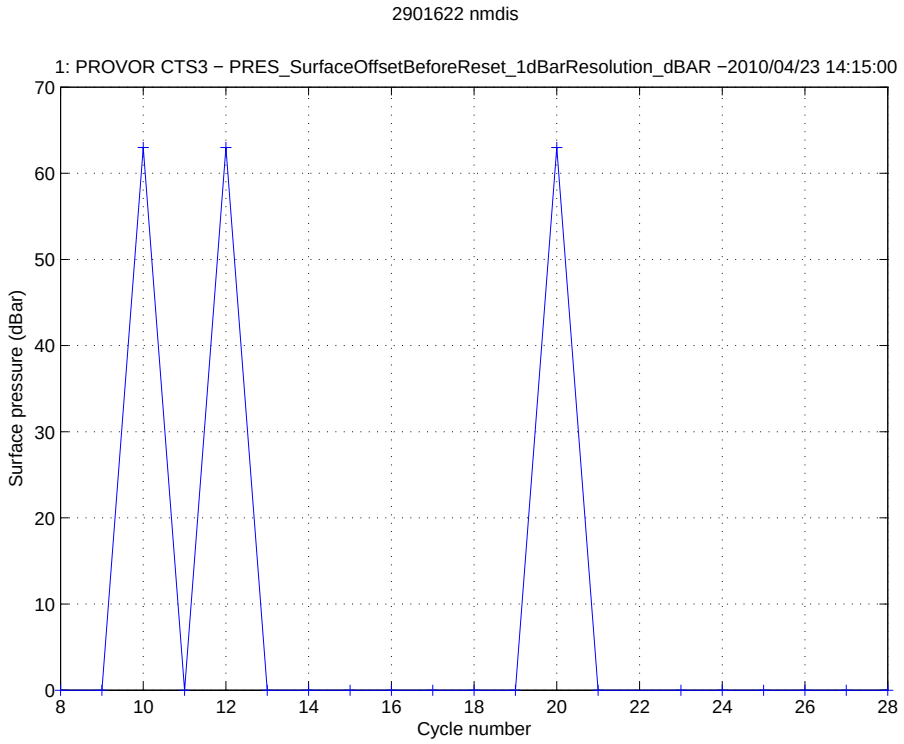

FIG. 9: Surface pressure for float 2901622