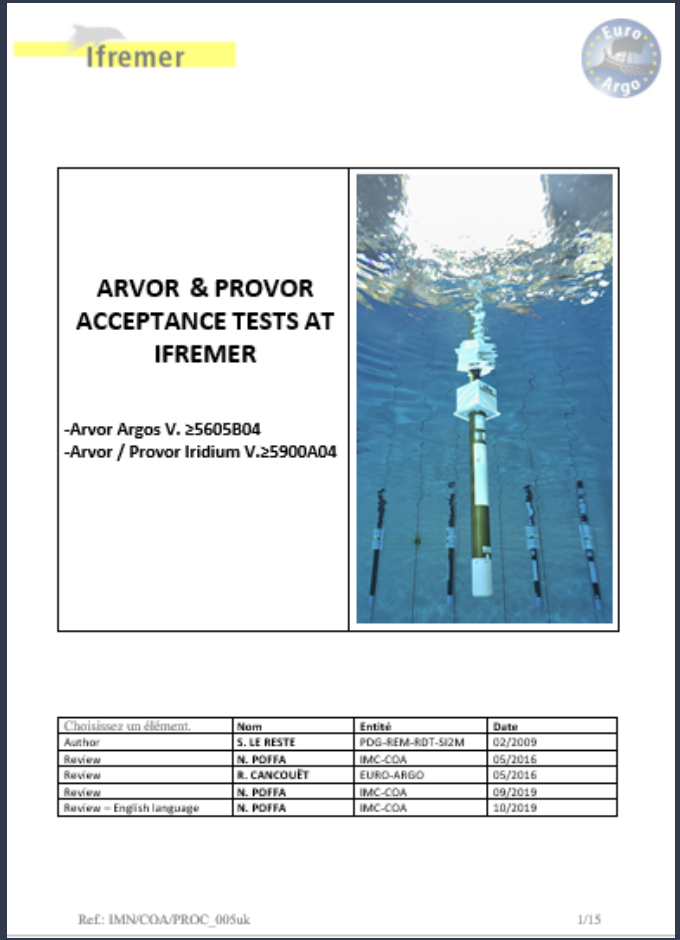
FLOAT ACCEPTANCE TESTS @ Ifremer / Euro-Argo

Presented at:
Arvor-Provor Workshop , 29/12/2020

- Common procedure for Argo-France / Euro-Argo testing at Ifremer
- +/- 100 floats each year
- 4 to 6 weeks booked at the Test-tank every year



Ifremer

ARVOR & PROVOR ACCEPTANCE TESTS AT IFREMER

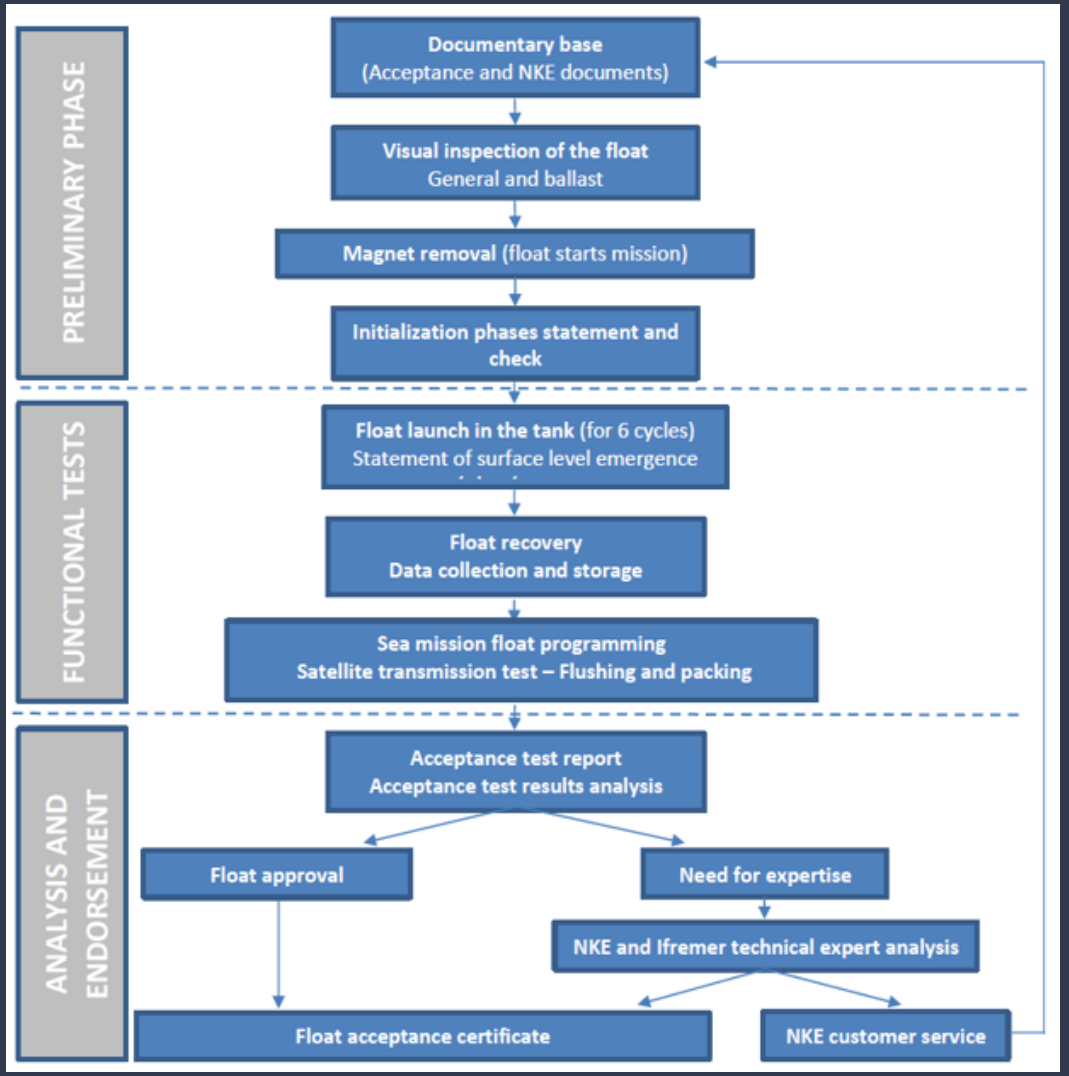
-Arvor Argos V. ≥5605B04
-Arvor / Provor Iridium V.≥5900A04

Choisissez un élément.	Nom	Entité	Date
Author	S. LE RESTE	PDG-REM-RDT-SI2M	02/2009
Review	N. POFFA	IMC-COA	05/2016
Review	R. CANCOUËT	EURO-ARGO	05/2016
Review	N. POFFA	IMC-COA	09/2019
Review – English language	N. POFFA	IMC-COA	10/2019

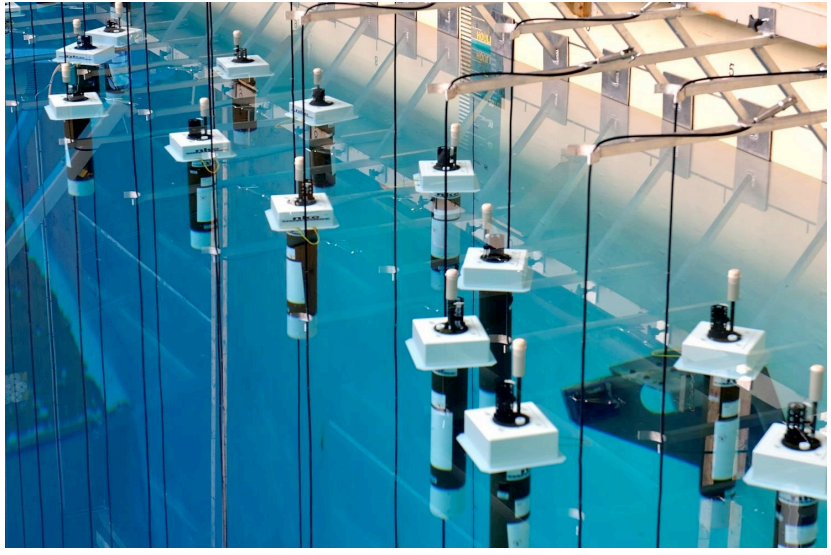
Ref.: IMN/COA/PROC_005uk

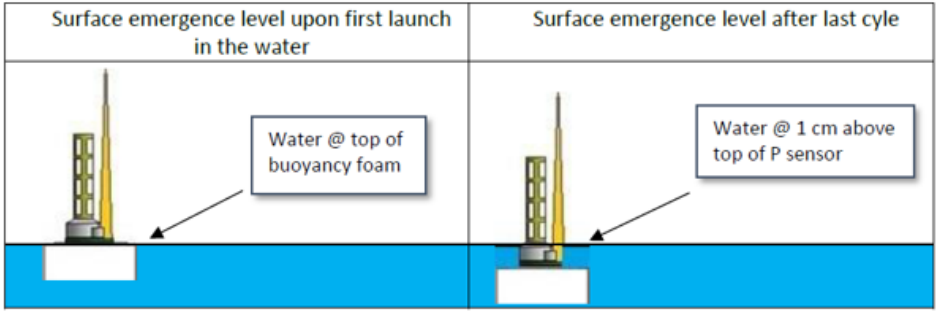
1/15

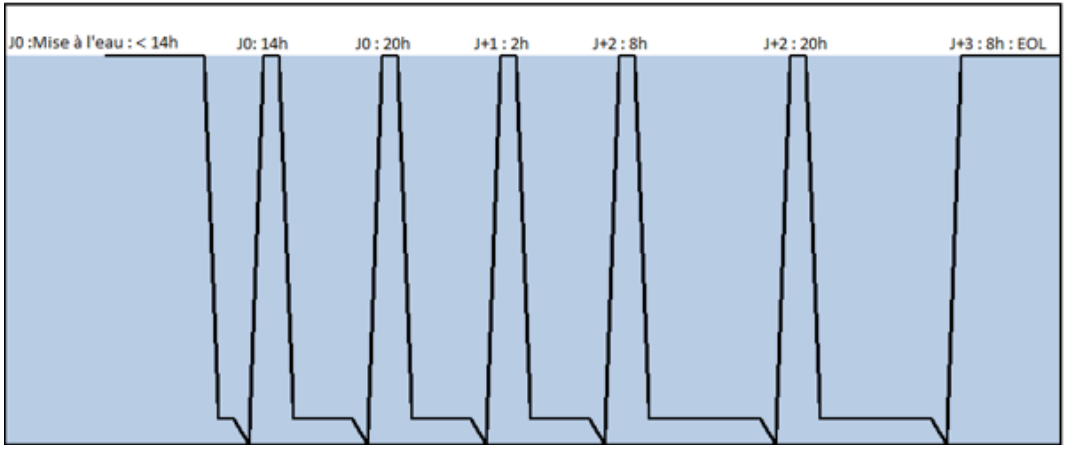
- Floats and documentation general integrity
- 3 days cycling tests in 20 m seawater depth
- Tests analysis and acceptance report



Raw data recorded over 6 cycles :







Functional tests results

Raw hydraulic data analysis

PTS/02 raw measurements comparison

Satellite communication tests

	CRITERIA	VALIDITY
FUNCTIONAL	Visual inspection	Float complies with specifications
	Self-tests sequence	Sequence complies with specifications
	PC communication	Bluetooth connection OK
	Surface emergence level	Water level according to Figure 7 ±5 mm
	Time drift (?TI)	< 2 sec. / day (< 10 min. / year)
	CTD test (?S)	Consistent measures
	Battery voltage (?VB)	>10 V
	Internal vacuum (?VB)	570 mbar < P < 630 mbar @20°C
	Firmware version (?VL) Checksum (!CK)	5605B04: Checksum DDDF 5605B05: Checksum 22D5 5900A00: Checksum 5CD4
HYDRAULIC	Cumulated time for solenoid valve action during first cycle	No criteria
	Cumulated time for solenoid valve action during following cycles	Lower limit: 2350 ds Upper lumit: 8000 ds
	Pump actions for float ascent	1 to 5 activations of 72 ds (= 2400 ds flat-rate + 1 to 5*72 ds)
METRO.	Temperature gap	<0.020 °C for all floats
	Salinity gap	<0.020 PSU for all floats
ARGOS	N1: Average messages number per transmission NIVmax: Average of maximum reception level per transmission N2 > - 120 dBm: Average messages number per transmission where reception level > - 120 dBm.	N1 ≥ 8 NIVmax ≥ 118 dBm N2 > - 120 dBm ≥ 3.5

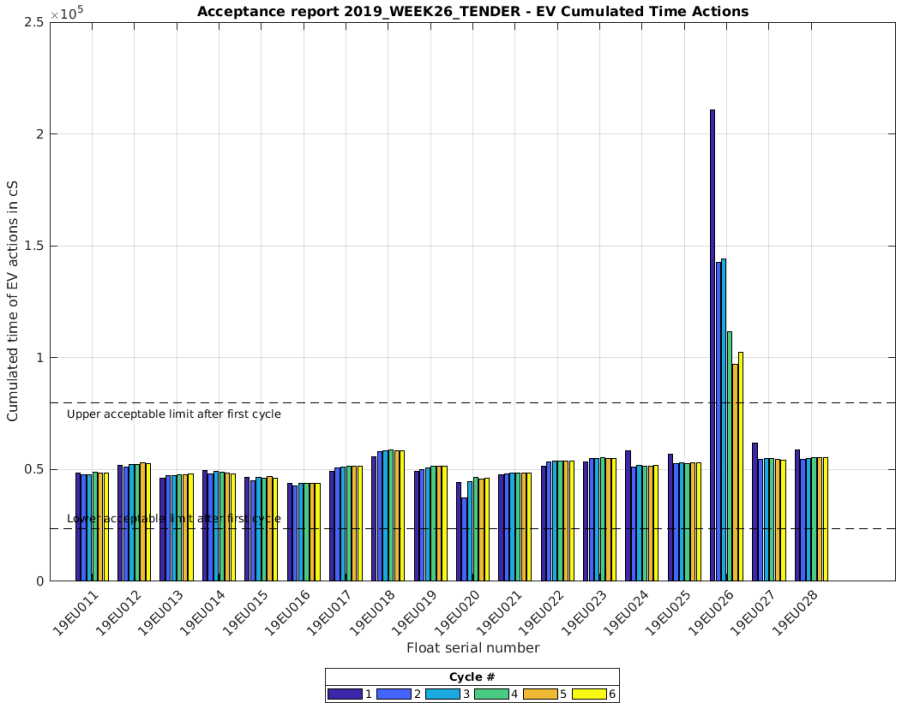
Float documentation (serial numbers, software versions etc..) are used to fill up Float metadata on DAC's deployment sheet

PLATFORM INFORMATION	1	PLATFORM_FAMILY	FLOAT
PLATFORM INFORMATION	1	PLATFORM_TYPE	ARVOR
PLATFORM INFORMATION	1	WMO_INST_TYPE	844
PLATFORM INFORMATION	1	PLATFORM_MAKER	NKE
PLATFORM INFORMATION	1	BATTERY_TYPE	Lithium
PLATFORM INFORMATION	1	BATTERY_PACKS	2 WILPA1621A
PLATFORM INFORMATION	1	FLOAT_SAIL_ID	19FR004
PLATFORM INFORMATION	1	FLOAT_SERIAL_NUMBER	AI2600-19FR004
PLATFORM INFORMATION	1	CONTROLLER_BOARD_TYPE_PRIMARY	I535
PLATFORM INFORMATION	1	CONTROLLER_BOARD_SERIAL_NO_PRIMARY	C190228-0092
PLATFORM INFORMATION	1	WMO_NUMBER	6902988
PLATFORM INFORMATION	1	IMEI	300234068809370
PLATFORM INFORMATION	1	BLUETOOTH_NUMBER	C190212-0392-A
PLATFORM INFORMATION	1	FIRMWARE_VERSION	5900A04
PLATFORM INFORMATION	1	STANDARD_FORMAT_ID	102005
PLATFORM INFORMATION	1	MANUAL_VERSION	33-16-033
PLATFORM INFORMATION	1	FIRMWARE_CHECKSUM	B8C9
PLATFORM INFORMATION	1	CORIOLIS_DECODER_VERSION	5.45

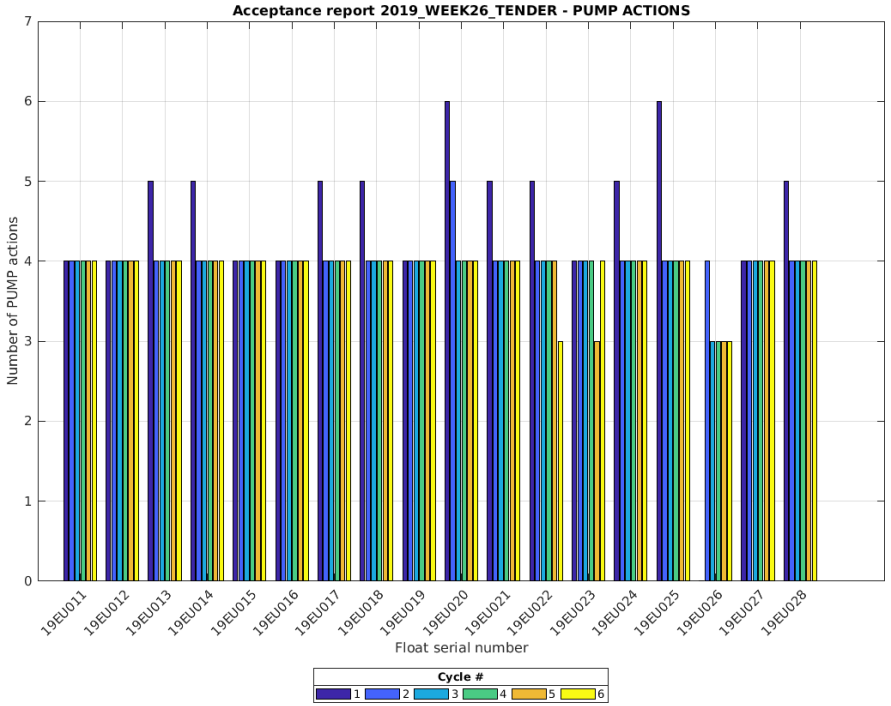
Acceptance tests results are also part of float's metadata entered on the DAC

ACCEPTANCE REMARKS	1	ACCEPT_VISUAL_CHECK	OK
ACCEPTANCE REMARKS	1	ACCEPT_BALLAST_CHECK	OK
ACCEPTANCE REMARKS	1	ACCEPT_FIRMWARE_VERSION	5900A04
ACCEPTANCE REMARKS	1	ACCEPT_CLOCK_SET_BEFORE	yes
ACCEPTANCE REMARKS	1	ACCEPT_CLOCK_SET_DATE_BEFORE	14/06/2019 11:05:00
ACCEPTANCE REMARKS	1	ACCEPT_BATTERY_VOLTAGE_BEFORE	10.7
ACCEPTANCE REMARKS	1	ACCEPT_INTERNAL_VACUUM_FULL_BEFORE	611
ACCEPTANCE REMARKS	1	ACCEPT_PRESSURE_BEFORE	-1
ACCEPTANCE REMARKS	1	ACCEPT_TEMPERATURE_BEFORE	20.837
ACCEPTANCE REMARKS	1	ACCEPT_SALINITY_BEFORE	0
ACCEPTANCE REMARKS	1	ACCEPT_FIRMWARE_CHECKSUM	B8C9
ACCEPTANCE REMARKS	1	ACCEPT_SPY_MODE_ON	OK
ACCEPTANCE REMARKS	1	ACCEPT_SHOW_MODE_OFF	OK
ACCEPTANCE REMARKS	1	ACCEPT_ARM_ON	OK
ACCEPTANCE DEPLOYMENT	1	ACCEPT_MAGNET_REMOVAL_TIME	24/06/2019 00:00:00
ACCEPTANCE DEPLOYMENT	1	ACCEPT_FLOAT_INTERNAL_CHECK	OK
ACCEPTANCE DEPLOYMENT	1	ACCEPT_BUOYANCY_BEFORE	Water @ top of buoyancy foam
ACCEPTANCE RECOVERY	1	ACCEPT_BUOYANCY_AFTER	Water @ top of P sensor
ACCEPTANCE RECOVERY	1	ACCEPT_CLOCK_DRIFT	N/A
ACCEPTANCE RECOVERY	1	ACCEPT_BATTERY_VOLTAGE_AFTER	10.6
ACCEPTANCE RECOVERY	1	ACCEPT_INTERNAL_VACUUM_AFTER	627
ACCEPTANCE RECOVERY	1	ACCEPT_INTERNAL_VACUUM_COMMENT	ok
ACCEPTANCE RECOVERY	1	ACCEPT_PRESSURE_AFTER	0
ACCEPTANCE RECOVERY	1	ACCEPT_TEMPERATURE_AFTER	24.555
ACCEPTANCE RECOVERY	1	ACCEPT_SALINITY_AFTER	0
ACCEPTANCE RECOVERY	1	ACCEPT_COMMENT	OK

Hydraulic (pump and valve actions) analysis

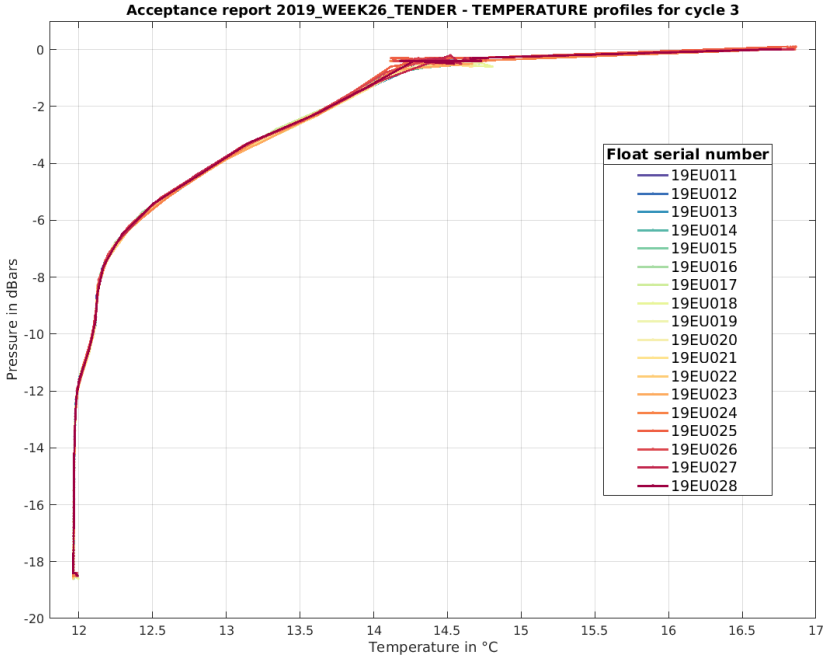


Cumulated valve actions time per cycle

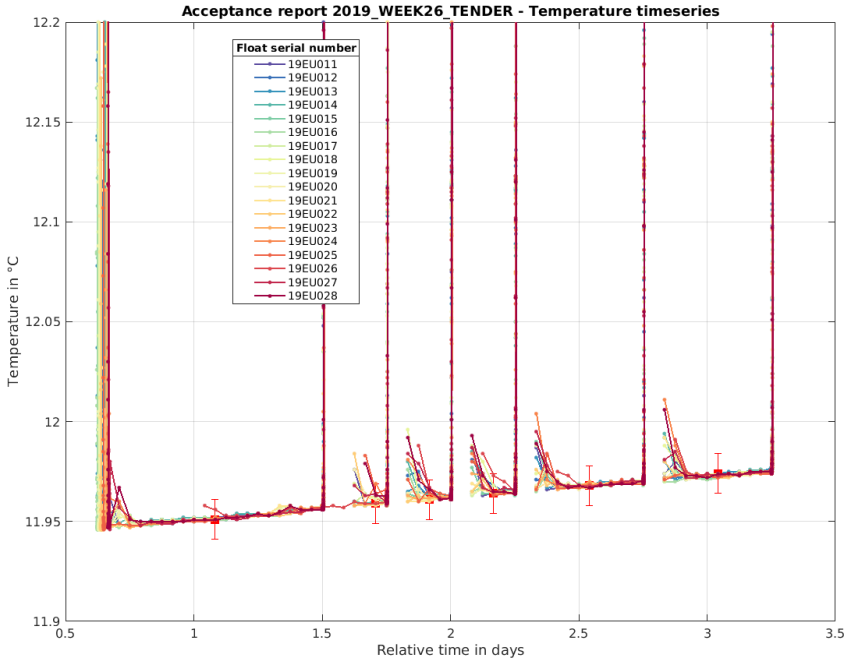


Number of pump actions per cycle

Raw CTDO2 data intercomparison :

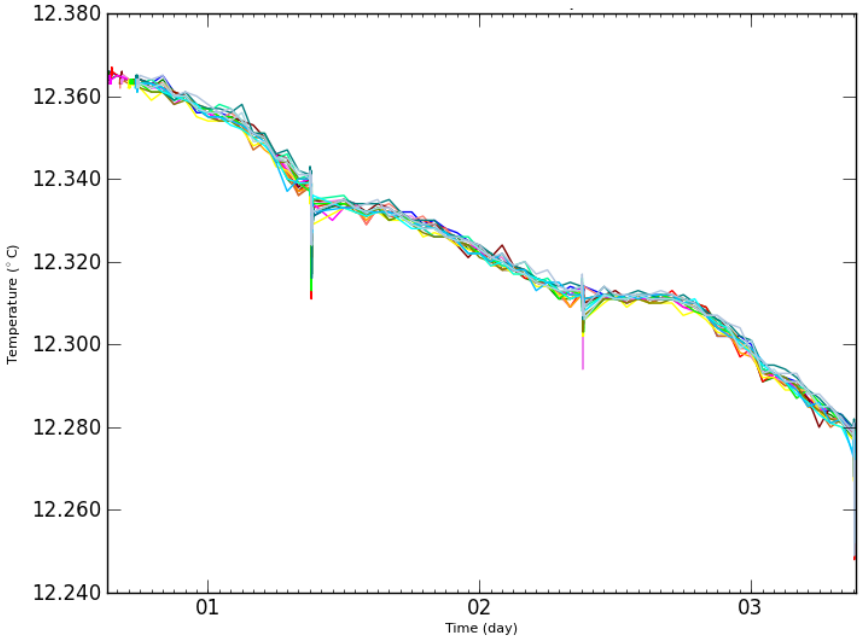


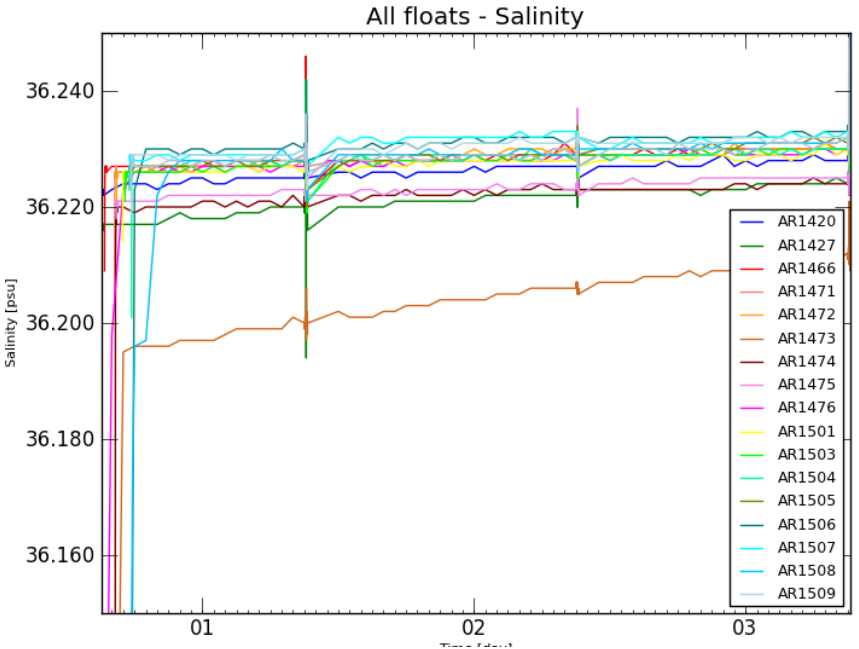
Single profiles comparison



3-days intercomparison (at « drift depth »)

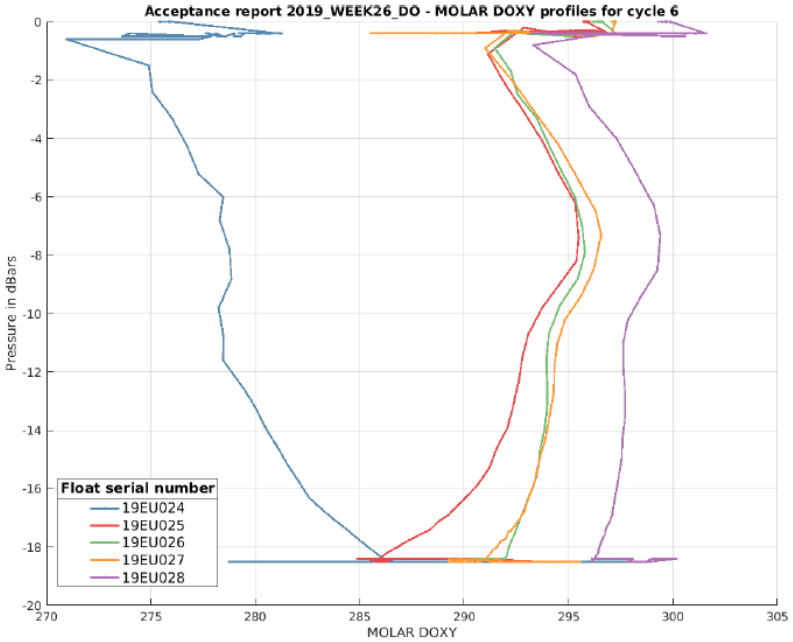
Temperature an salinity intercomparison :

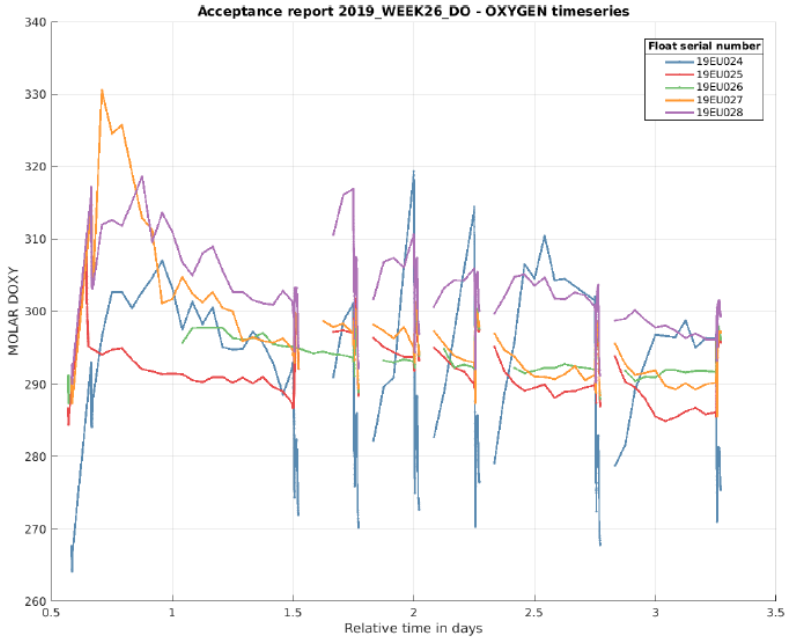




+3-days record with global resolution < 5 m°C for temperature and 5mPsu for salinity

Oxygen concentration intercomparison :





Measurements intercomparison discussion:

- Needs a sufficient number of floats
- Not a “metrological” test, no reference measurement
- Allows to test a great number of floats at the same time (up to 40)
- Limited operator work over the 3-days test
- Very stable seawater environment, especially at full tank depth
- Floats with deficient sensors are easily and accurately spotted