

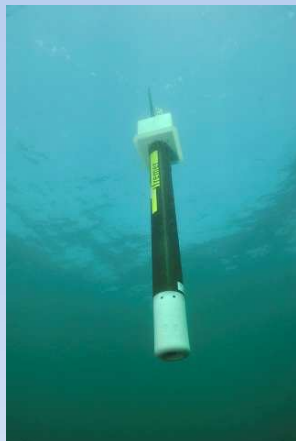
# Float Technology Developments



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## ARVOR : a light CTD float for the ARGO project

This new float has been developed for the needs of the ARGO community. Exclusively designed for temperature and salinity measurements, it is less bulky, lighter and cheaper. Its new dimensional optimisation with the same high performance as the Provior was made possible thanks to technological developments in housing, hydraulic circuitry and electronics. An industrial model has been tested and certified.



### Arvor features :

- \* Up to 250 cycles at 2000m depth :  
at 2000 samples/profile, averaged into 110 CTD slices for transmission (programmable) with CTD continuous pumping during profile sampling.
- \* Programmable period (typ. 10 days), profile depths (typ. 2000 m) and drift depths (typ. 1000 m)
- \* Measurements possible during descent, drift and ascent
- \* Mission launched by simply magnet removal
- \* Grounding management
- \* Easily deployed by just one person  
Height : 156 cm without antenna  
Weight < 20 kg
- \* Wireless programming (bluetooth)
- \* Auto-check status and position sent via Argos after launching



### Results at sea

- 2007: 1 prototype fitted with light battery pack (2/3 of actual pack size): 186 profiles completed
- February 2009: 2 Arvor currently being tested in south of Indian Ocean, more than 50 cycles completed today for each one.
- May 2009: 1 Arvor deployed in Atlantic Ocean is currently being tested

## SATELLITE COMMUNICATION IMPROVEMENTS IN PROGRESS

In marginal seas, satellite communication improvements will allow the Arvor:

- to reduce surface time to lower the risks of incidents due to shocks and trawling, to delay beaching (thus increasing lifetime), as well as biofouling reduction,
- to implement downlink capabilities for float remote control in order to adapt mission parameters to specific events monitoring,
- to transmit higher amounts of data, increasing profile resolution.

In accordance with new satellite systems, Ifremer is developing new devices:

a) For Iridium which give 66 satellites with global and permanent earth coverage, with 2 way communication.

- \* An antenna was designed and tested in 2008, a 2nd source antenna is currently tested (more robust and cheaper)
- \* 2 Arvor floats with Iridium modems have been manufactured, software is undergoing long term lab tests. Sea-trials are planned in Mediterranean sea next autumn (with OGS collaboration)
- \* Performance: less than 5 minutes to transmit 1 complete profile data (vs 6 hours today for Argos)

b) For Argos3 which has 6 non-stationary polar-orbit satellites, with 1 active Argos3-mode (MetopA) available today, another has been recently launched, with 2 way communication.

\* Tools have been designed to understand and evaluate Argos3 performances. The aim is to find an appropriate methodology for using Argos3 on floats. The capability of transmitting one profile during one satellite pass needs to be assessed.

- An electronic waterproof case has been fitted with one PMT (Argos3 modem) with an aerial antenna and placed on a flat roof at Ifremer to have a clear view of the horizon. It is driven by a computer.

- An evaluation software has been designed to do the trials. The aim is to test random protocol (Argos2 mode), interactive mode (Argos3 low & high data rate) or "pseudo-ack" mode (based on satellite pass predictions). Assessment will be done on transmission performance (error rates, power balance, scheduling strategy for the float to surface, using pass prediction tables), and downlink communication.

- \* A new double band and pressure resistant antenna, is under design.
- \* 2 Arvor floats will be produced on 4th quarter of 2009, embedding modem and pressure antenna.
- \* Expected performance: less than 15 minutes to transmit 1 complete profile data.



Arvor with Iridium transmission



New Iridium Antenna (under design)

Platform messaging transceiver (PMT)

Argos3 test platform

www.ifremer.fr

Ref.: CS221002d

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