



CRUISE :

PIRATA FR-24

VESSEL :

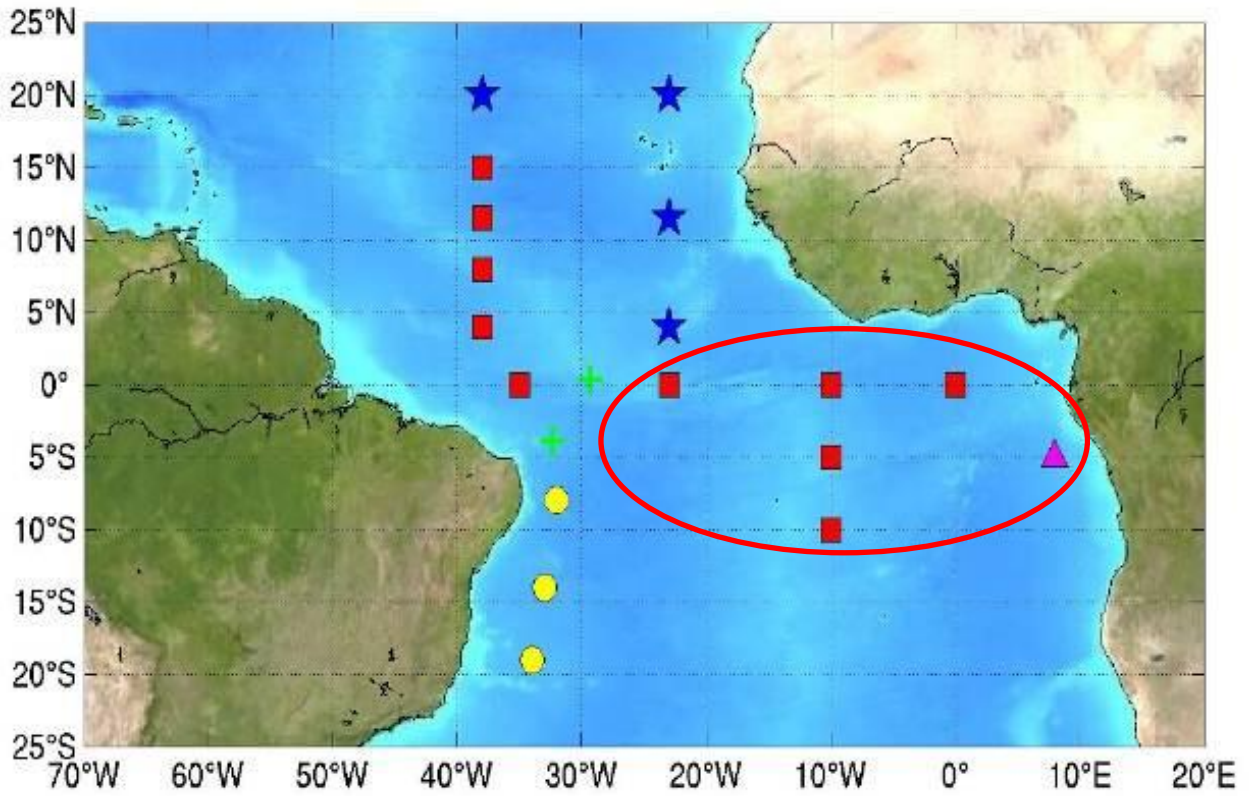
LE SUROIT

Dates :

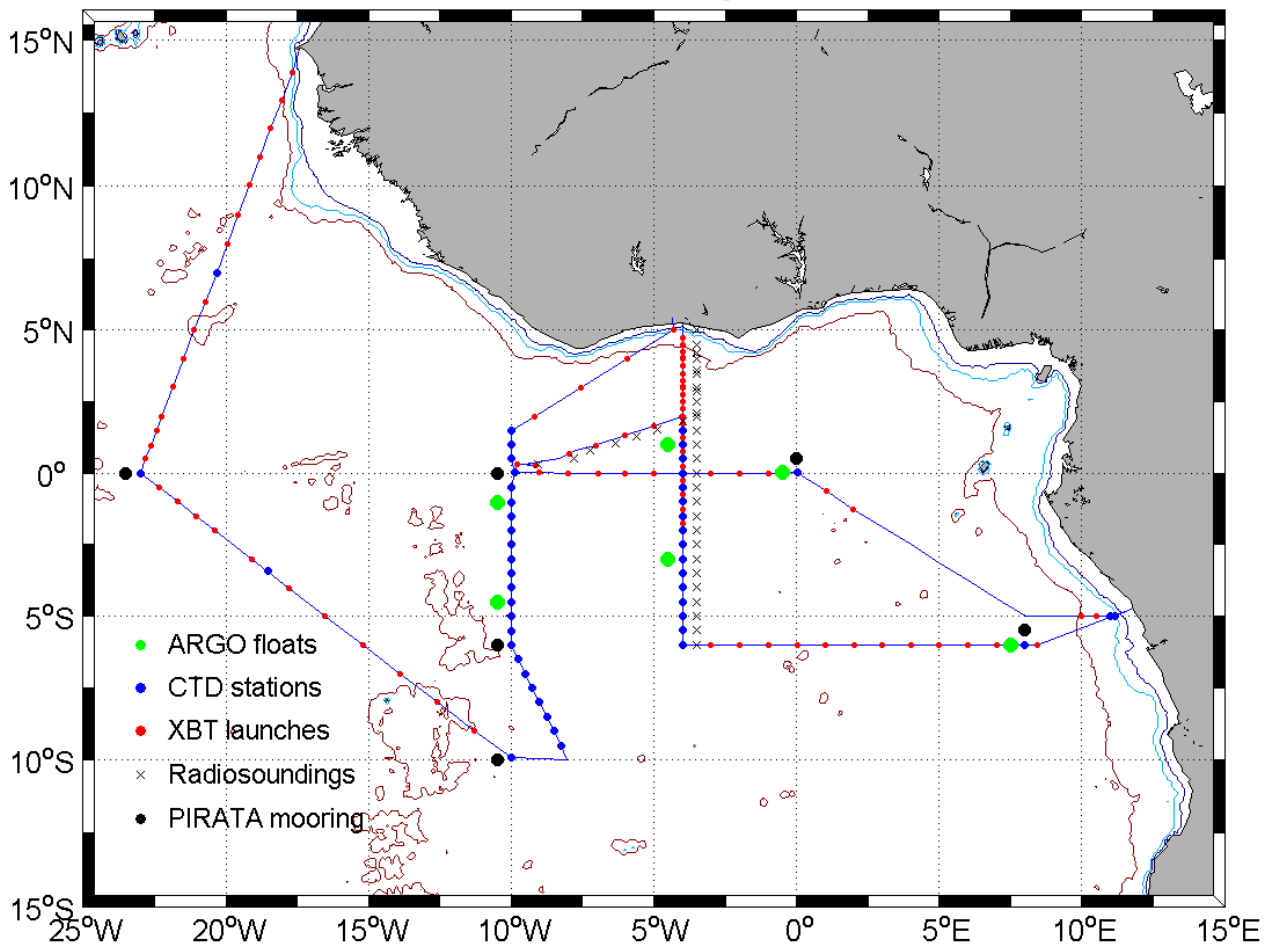
April 9 - May 22, 2014



General maps :



PIRATA FR24 - Legs 1 et 2





Summary :

PIRATA (« *Prediction and Research Moored Array in the Tropical Atlantic* ») is a multinational programme (France, Brazil, USA) of operational oceanography initiated in 1997 within the international CLIVAR (*Climate Variability and predictability*) program framework, and realized in the framework of an international cooperation between USA, Brazil and France (committed countries through a Memorandum of Understanding). It constitutes the main observations network in the tropical Atlantic (CLIVAR, OOPC, GOOS, GCOS) for climate prediction and research, and contributes to OceanSITES.

PIRATA is a program for the studies of air-sea interaction in the Tropical Atlantic to seasonal, interannual or longer timescale. PIRATA maintained a network of 10 ATLAS buoys from 1997 to 2005, and has maintained 18 from the summer 2013 (due to successive extensions: 3 buoys off Brazil in 2005, 2 buoys along 23°W and 2 buoys along 20°N by USA in 2006 & 2007, and one buoy off Congo in 2013). ATLAS type buoys allow the description and understanding of the evolution of the upper ocean thermal structure, ocean-atmosphere exchanges of heat and water, spatial and temporal variations of momentum. Observed parameters are used to estimate the exchanges at the air-sea interface along with the oceanic thermohaline structure down to 500m depth. Oceanic (temperature and salinity between the surface and 500m) and atmospheric at the ocean surface (wind direction, wind velocity, air temperature, relative humidity, rainfall, shortwave radiation) data are daily transmitted in real time through ARGOS, and available through internet.

In the framework of PIRATA, France is in charge of 6 ATLAS moorings and of two equatorial currentmeter moorings at 23°W-0°N (part of PIRATA international) and at 10°W-0°N (installed in the framework of EGEE/AMMA in 2006, now part of PIRATA-France from 2008). PIRATA-France is also in charge of the maintenance of one tide-gauge at São Tomé.

The PIRATA FR24 cruise allowed to replace the six ATLAS buoys at 23°W-0°N, 0°E-0°N, along 10°W (10°W-10°S, 10°W-6°S, and 10°W-0°E), and at 6°S-8°E. The CO₂ parameters sensor installed at 10°W-6°S has also been replaced (PI : N.Lefevre).

The ADCP currentmeter mooring at 10°W-0°N has been replaced and the one at 23°W-0°N was replaced by GEOMAR in May 2014.

As during previous years, the PIRATA FR24 cruise allowed to validate the transits by carrying out CTD-OS/ADCP profiles along sections at 10°W (repeated yearly), 3°W, and off Congo. 4 surface drifting buoys (SVP-BS) has been deployed for INSU/SOERE CTDO₂ (PI: G.Reverdin) along with 6 ARGO profilers, along with numerous sea water sampling (surface and during CTD casts) have been done for the analysis of salinity, nutrients, carbon parameters (DIC, TA, C₁₃) and primary production (pigments).

Finally, the second part of the PIRATA FR24 cruise allowed (so contributing to the French LEFE national programme "*PIRATA 2014: boundary layer and convection in the Gulf of Guinea*" of G. DeCoetlogon/LOCEAN) to carry out isotopomeres measurements (oxygen isotopes ratio of water vapour with a Picarro) along with atmospheric radiosoundings across the Gulf of Guinea.

Additionally, the PIRATA FR24 cruise also allowed :

- i) to retrieve two acoustical moorings of NOAA/PMEL (following request by R. Dziak, robert.p.dziak@noaa.gov) at 5°S-16°30'W and 10°W-8°W, as their releaser batteries would expire at the end of October 2014...
- ii) to add OTN sensors (for mammals studies and monitoring; PI: FWhoriskey@Dal.Ca; Dalhousie University, Halifax, Nova Scotia, Canada)) at 200m depth on each ATLAS buoy.
- iii) to add chipods (for turbulence studies) on ATLAS buoys at 23°W-0°N and 10°W-0°N at 30m depth (PI: Jim Moum : moum@coas.oregonstate.edu; Oregon State University, Corvallis, USA).



List of scientists onboard :

Name	Surname	Speciality	Task onboard	Organism	Cruise leg		
					1	2	3
GRELET	Jacques	Electronic	ATLAS, CTD/LADCP	IRD	1	2	
ROUBAUD	Fabrice	Electronic	ATLAS, CTD/LADCP	IRD	1	2	
BAURAND	François	Chemistry	Acquisition & analysis	IRD	1	2	
FICHEN	Lionel	Electronic	ATLAS, CTD/LADCP	INSU	1		
GOURIOU	Yves	Physics	Chief scientist 1 st leg.	IRD	1		
PLANTON	Yann	Physics	Acquisition CTD/LADCP	Univ. Toulouse, MF/CNRM	1		
DERRIEN	Nicolas	Chemistry	Acquisition & analysis	IUT Brest	1		
TOUALY	Elisée	Physics	Acquisition CTD/LADCP	Université Abidjan	1		
ASSEMIAN	Clément	Physics	Acquisition CTD/LADCP	CRO Abidjan	1		
N'GUESSAN	Benjamin	Physics	Acquisition CTD/LADCP	CRO Abidjan	1		
BOURLES	Bernard	Physics	Chief scientist 2 nd leg.	IRD		2	
JOUANNO	Julien	Physics	Acquisition CTD/LADCP	IRD		2	
LAMANDE	Nolwenn	Chemistry	Acquisition & analysis	IFREMER		2	
FELTRIN	Charlotte	Physics	Acquisition CTD/LADCP	IFREMER		2	
DEMANGE	Jérôme	Physics	Acquisition CTD/LADCP, Picarro, Radiosoudings	LOCEAN		2	
BENETTI	Marion	Physics	Acquisition CTD/LADCP, Picarro, Radiosoudings	LOCEAN		2	
ENET	Séverine	Physics	Acquisition CTD/LADCP	SHOM		2	
TOTAL number per leg :					10	10	



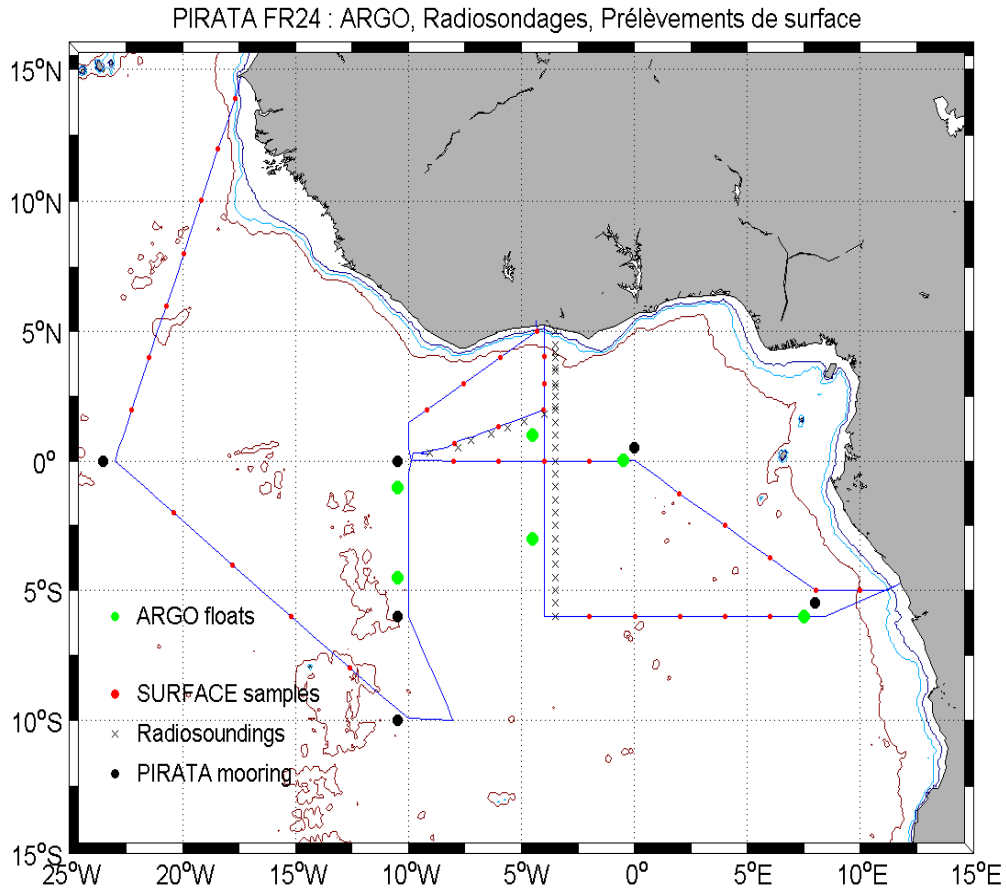
Operation summary :

Operations	Leg 1			Leg 2		
	Date	Position	Nb	Date	Position	Nb
ATLAS buoy replacement	14/04/2014	0°N-23°W	1			
ATLAS buoy retrieving	19/04/2014	10°S-10°W	1			
ATLAS buoy deployment	20/04/2014	10°S-10°W	1			
ATLAS buoy replacement	23/04/2014	6°S-10°W	1			
ATLAS buoy retrieving				03/05/2014	0°N-10°W	1
ATLAS buoy deployment				04/05/2014	0°N-10°W	1
ATLAS buoy replacement				07/05/2014	0°-0°W	1
ATLAS buoy replacement				12/05/2014	6°S-8°E	1
ADCP mooring replacement	26/04/2014	0°N-10°W	1 ¹			
Hydrophone mooring retrieving	17/04/2014	5°S-16°W	1			
Hydrophone mooring retrieving	21/04/2014	10°S-8°W	1			
CTD profiles			27			21
LADCP profiles			27			21
ARGO profilers deployment			2			4
SVP-BS buoys deployments			4			
XBT profiles			33			59

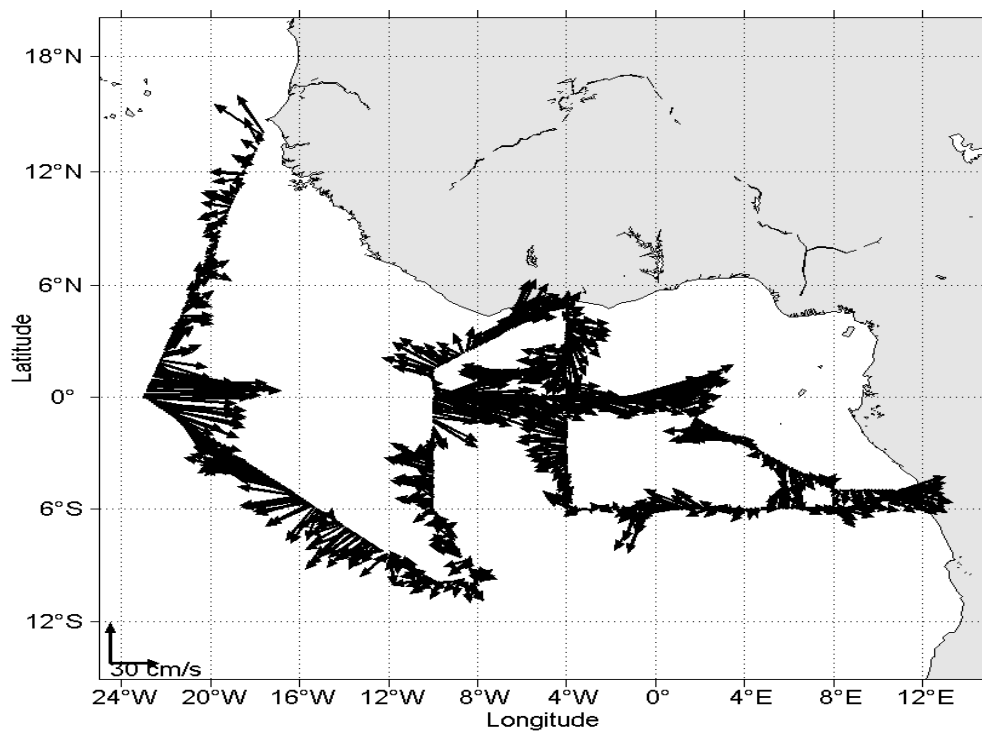
Operations	Leg 1			Leg 2		
	Date	Position	Nb	Date	Position	Nb
Surface water samplings			15			19
Radiosoundings						33
SVP-BS (0007) deployment	13/04/2014	2°N-22°W	1			
SVP-BS (0008) deployment	14/04/2014	0°N-23°W	1			
SVP-BS (0010) deployment	25/04/2014	2°S-10°W	1			
SVP-BS (0009) deployment	27/04/2014	0°N-10°W	1			
ARGO AR1401 deployment	24/04/2014	5°S-10°W	1			
ARGO AR1402 deployment	25/04/2014	1°S-10°W	1			
ARGO AR1403 deployment				08/05/2014	0°N-0°E	1
ARGO AR1404 deployment				12/05/2014	6°S-8°E	1
ARGO AR1405 deployment				17/05/2014	3°S-4°W	1
ARGO AR1406 deployment				19/05/2014	1°N-4°W	1
Thermosalinograph	continuously			continuously		
Vesessel mounted ADCP	continuously			continuously		
BATOS meteo measurements	continuously			continuously		
PICARRO O2 isotopes				continuously		

Major issues :

- CO2 sensor does not work at 6°S-10°W.
- Due to late arrival off Congo, clearances were over and very few profiles/measurements were done off Congo (but continuous measurements).
- Fouling issues on the TSgraph.
- Batteries issues on the moored ADCP at 10°W-0°N: only the March 2012-July 2013 period was sampled.

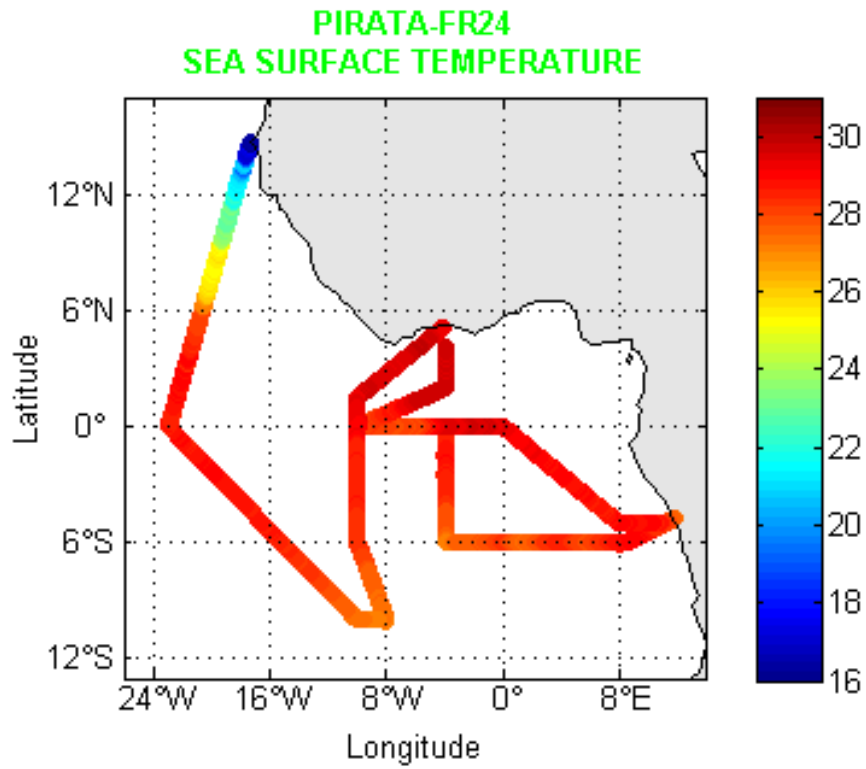
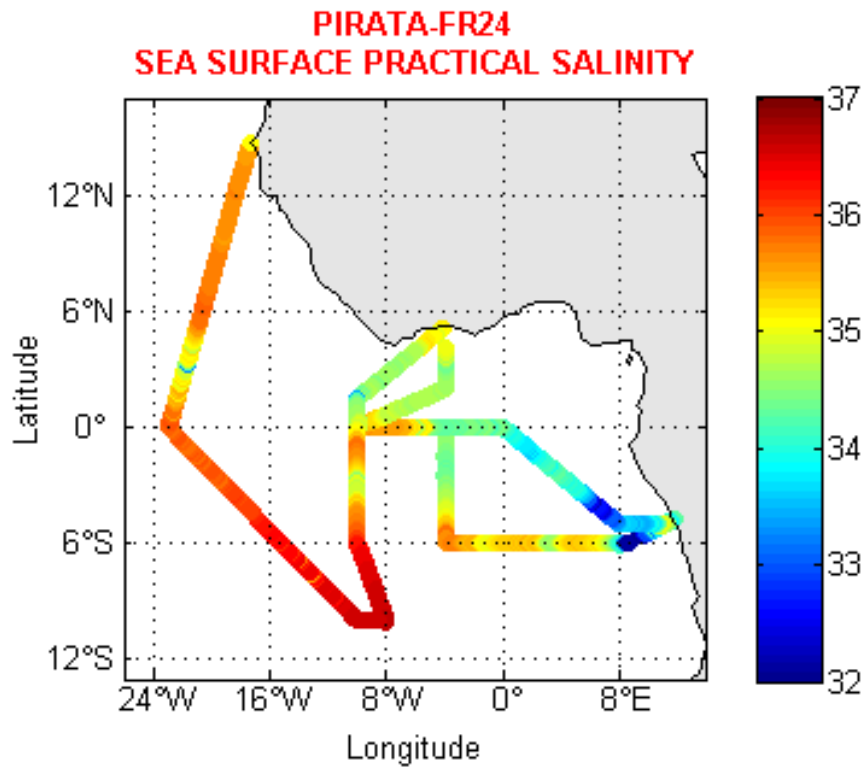


ADCP 0-50m depth mean horizontal currents:





TSGRAPH:





Horizontal components of the current along 10°W (not validated data) :

