



DACCIWA

Dynamics
West Africa

Systems in

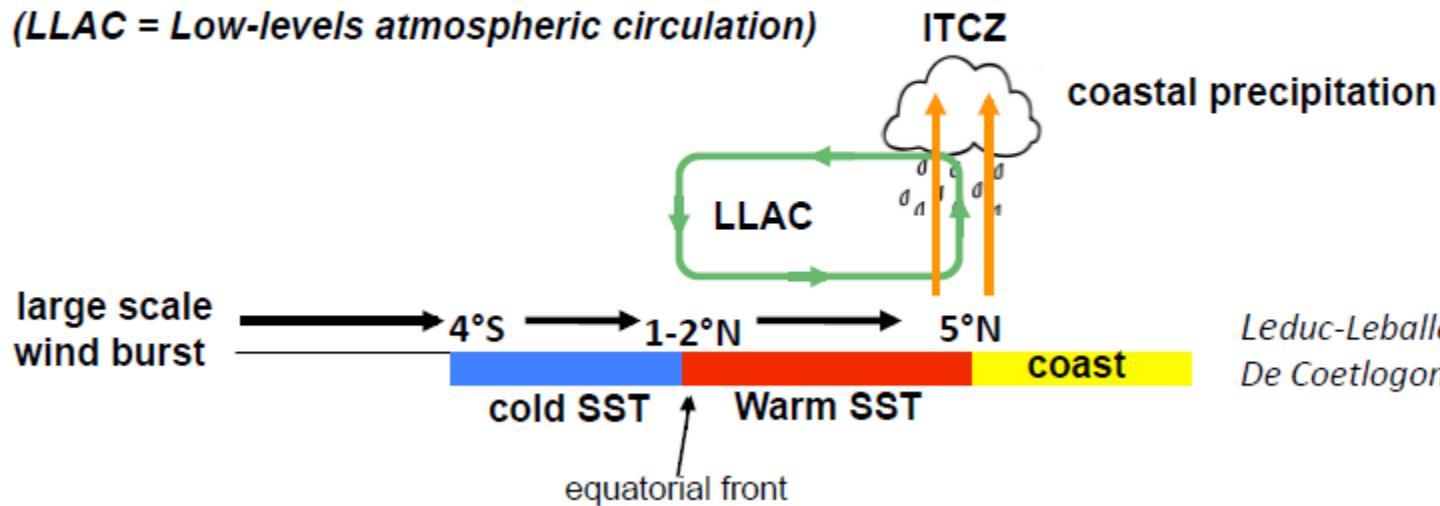
Observing the Low-level Atmospheric Circulation in Tropical Atlantic (OLACTA): Overview

R. Meynadier, C. Flamant, **G. de Coetlogon**, L. Eymard, M. Diakhate, D. Parker, R. Fitzpatrick, J. Marsham, P. Knippertz and A. Fink

Objectives

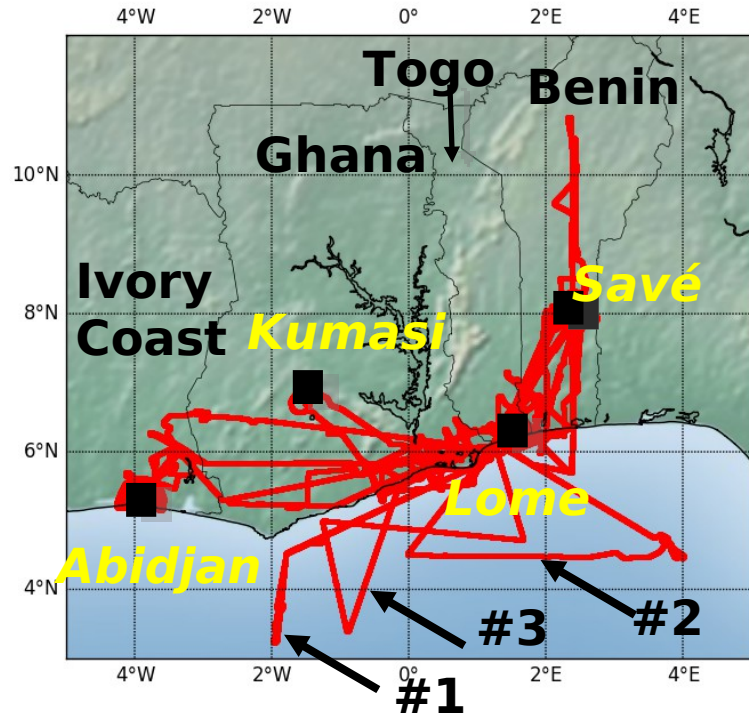
Meridional Low-Level Circulation between Equator and the Guinean Coast

(LLAC = Low-levels atmospheric circulation)



Leduc-Leballeur et al. (2013)
De Coetlogon et al. (2013)

OLACTA flights and datasets



Funded through EUFAR TA

Date	Flight number	Time (UTC)	Location	Objectives
02.07.2016	ATR_as2 1	14:45 - 18:07	Ocean	Air-sea interactions; Dust aerosols and urban plume
07.07.2016	ATR_as2 6	13:17 - 16:50	Ocean	Air-sea interactions
14.07.2016	ATR_as3 4	11:38 - 14:46	Ocean	Air-sea interactions; Biomass burning plume

Airborne measurements

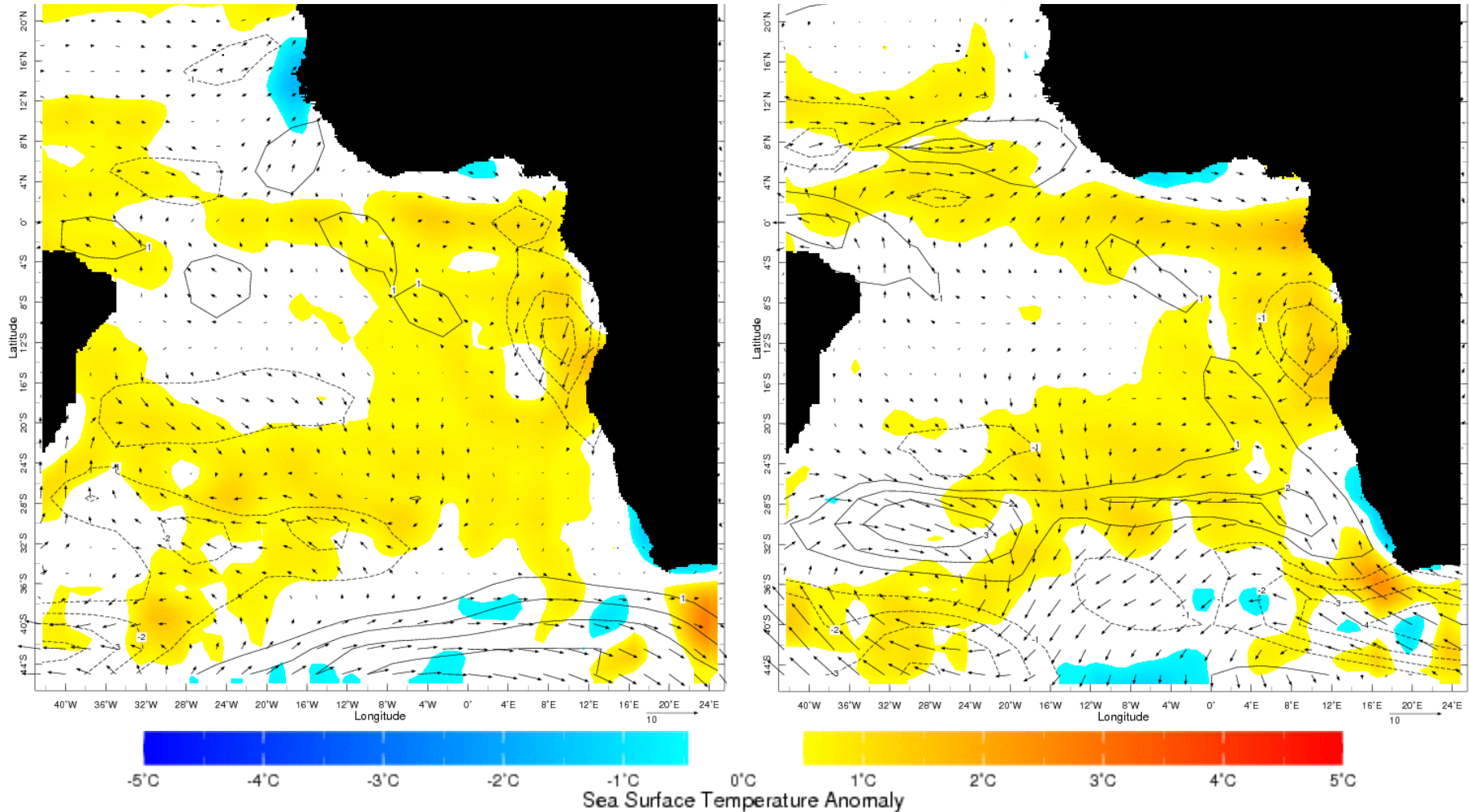
- Nadir pointing backscatter LIDAR
- Turbulence probes (heat fluxes)
- In situ dynamics and thermodynamics probes
- CLIMAT infrared thermometer (SST gradients)
- Downward facing broad-band VIS & IR radiometers.

- **2 out of 3 flights**
- **Not yet available**
- **OK**
- **doubtful**
- **OK**

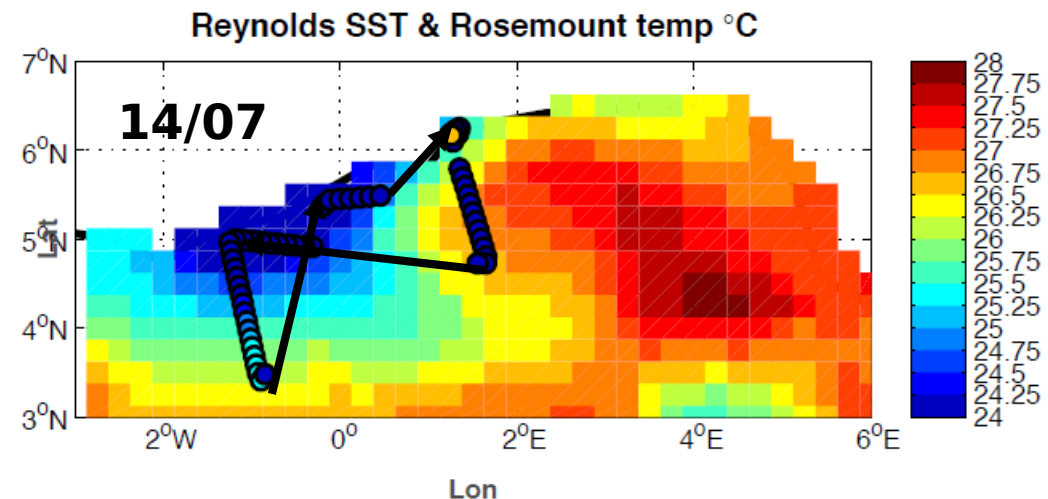
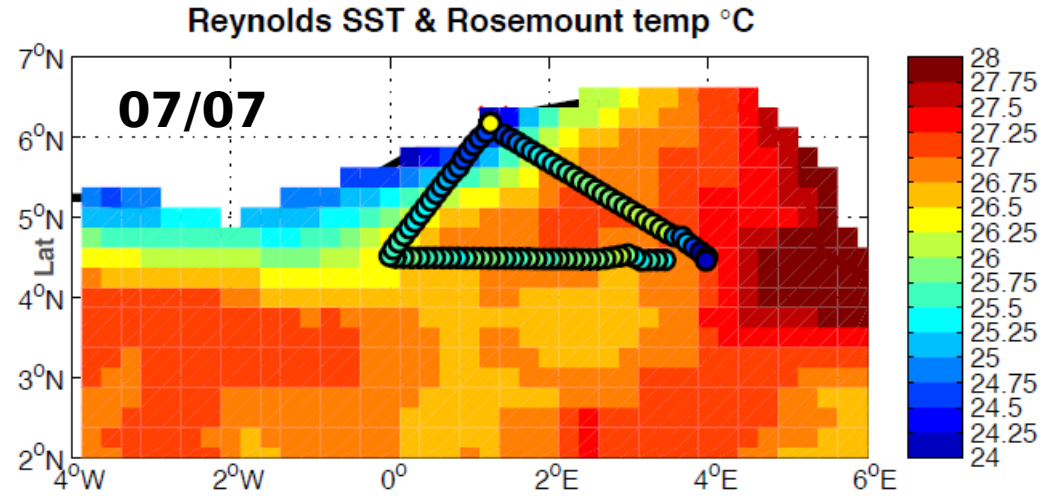
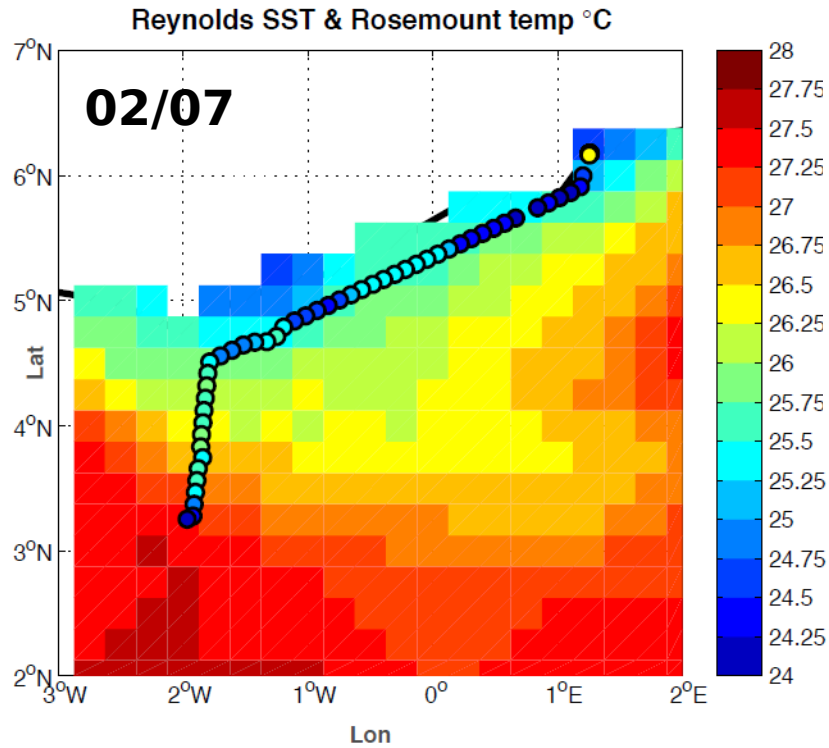


2016 Gulf of Guinea air-sea interactions situation

Reynolds SST (shaded °C), NCEP 10-meters wind (vectors m/s) and 10-meters wind speed (contours m/s) monthly mean anomaly based on 1971-2000 climatology



OLACTA flights

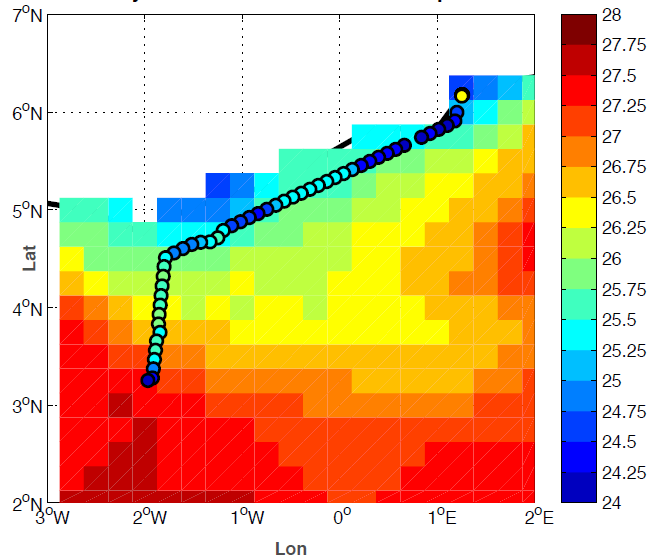


Coastal upwelling well established by the end of the campaign

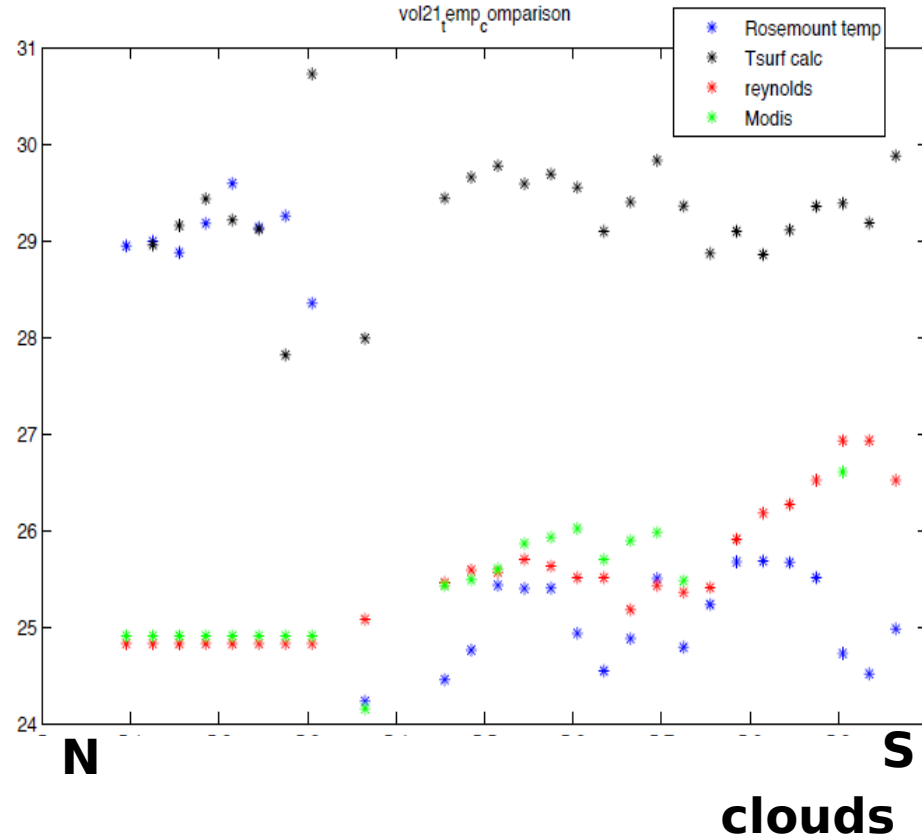
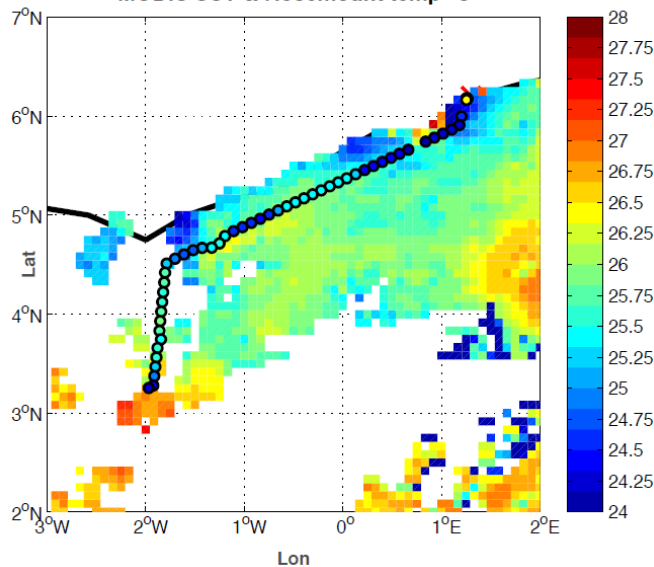
OLACTA flight #1



Reynolds SST & Rosemount temp °C



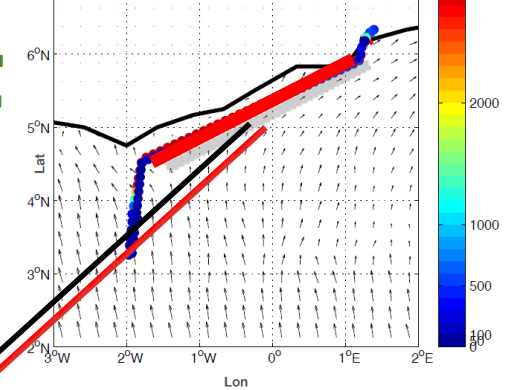
MODIS SST & Rosemount temp °C



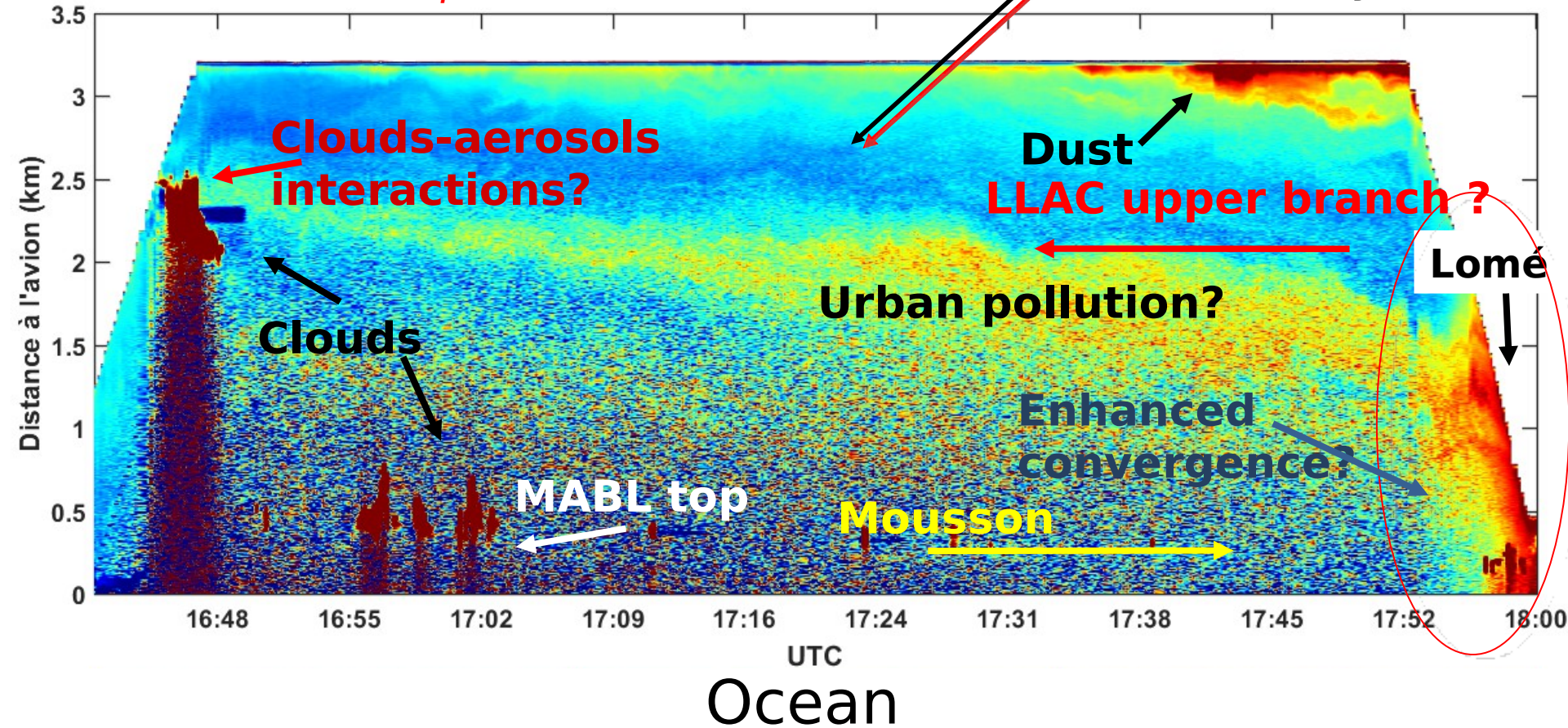
- MODIS and Reynolds are coherent
- T_{surf} from CLIMAT is not
- T_{air} higher over colder SSTs

OLACTA flight

AEROSOL CONTENT OVER OCEAN SEEN BY LIDAR



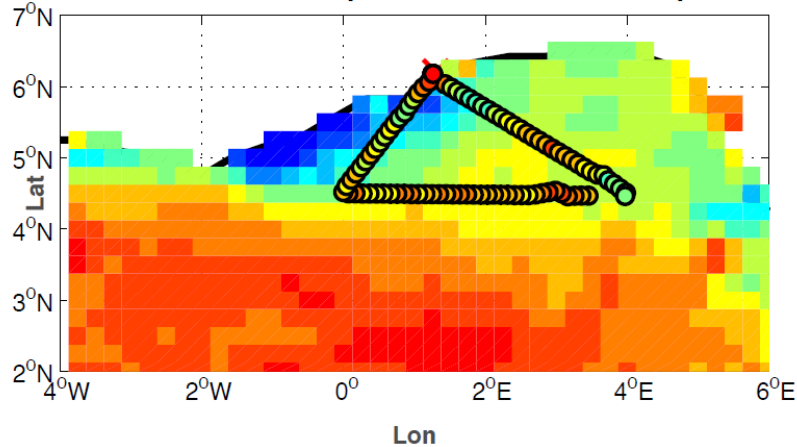
Aerosol depolarisation - lidar ULICE (P. Chazette - LSC) **2 July 2016**



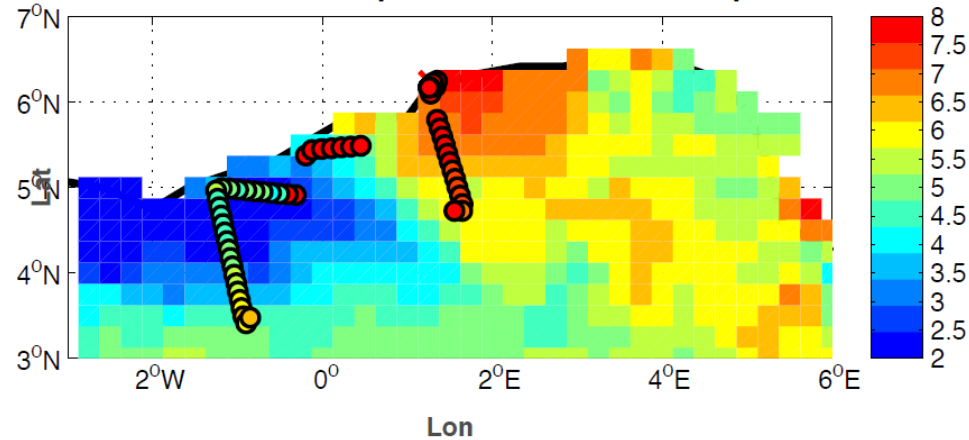
OLACTA flights #2 & #3



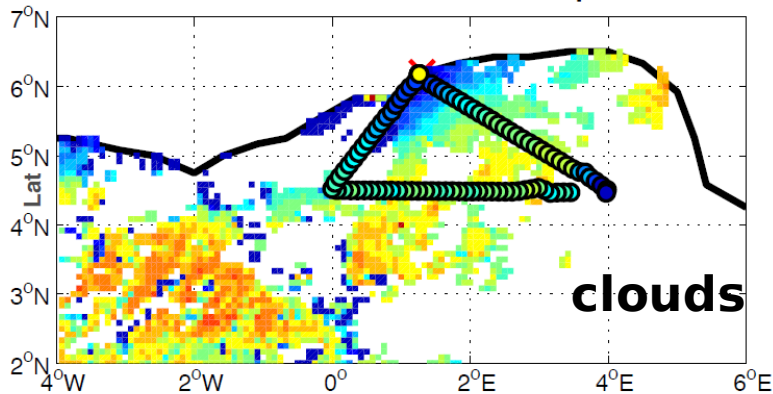
ASCAT 10-meters wspd & 100-meters ATR wspd m/s



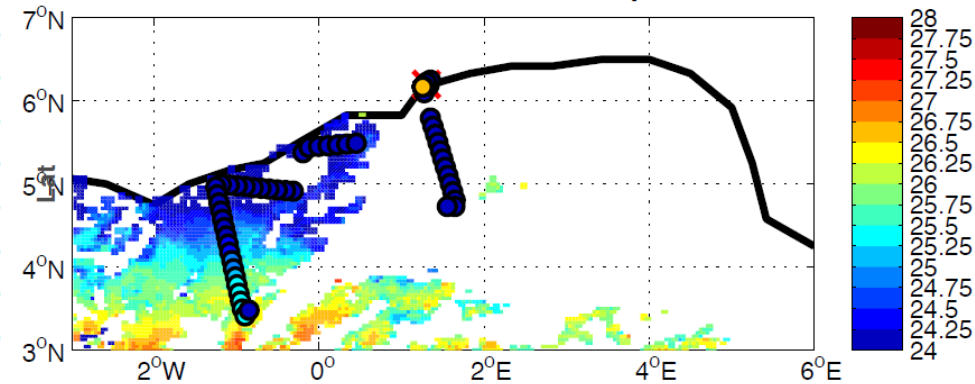
ASCAT 10-meters wspd & 100-meters ATR wspd m/s



MODIS SST & Rosemount temp °C



MODIS SST & Rosemount temp °C



Contrasted situations with cold waters developing to the West, and warmer waters off Togo and Benin.

Conclusion



Air-sea interactions during the onset of the coastal upwelling

- 3 flights in contrasted coastal SST situations

Impact on boundary layer dynamics based on turbulent fluxes analysis

- Golden case (flight #1) for looking at the impact of air-sea interactions on pollutants distribution at the coast

Modelling activities

- NCEP CSFR analyses/reanalyses
- WRF simulations 9-km horizontal grid size (post-campaign)

UPMC

- WRF simulations 4-km horizontal grid size (forecast) Univ

Leeds

- WRF/CHIMERE simulations (post-campaign) UPMC

- WRF/NEMO simulations (post-campaign) UPMC

