

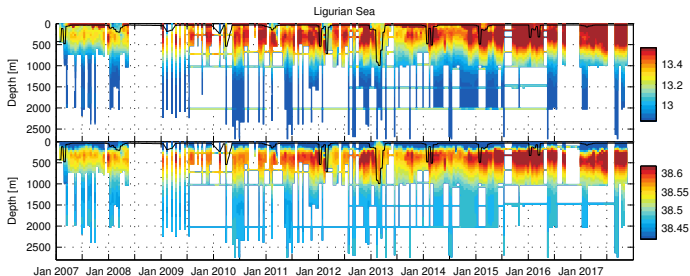
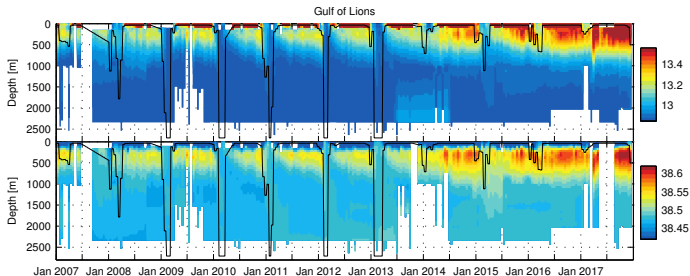
CARTE  
RÉDUITE DE LA  
MER MÉDITERRANÉE.

Echelle de Cent Lieues Communes.

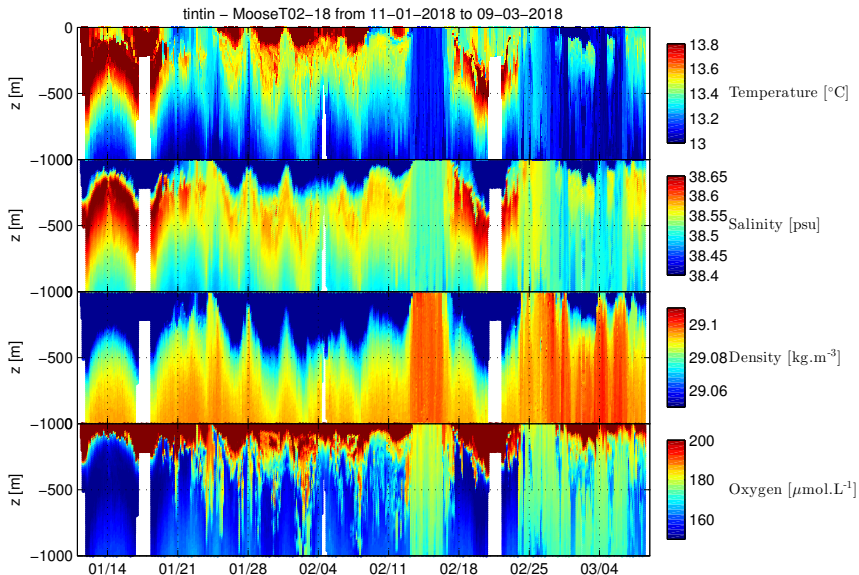
The next deep waters formed in the Northwestern Mediterranean Sea will be warmer and saltier than ever !

Longitude Orientale du Meridien de Paris.

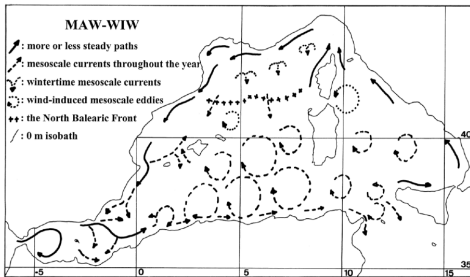
# The next deep waters formed in the Northwestern Mediterranean Sea will be warmer and saltier than ever !



# Good news – 2018 is a deep convective year

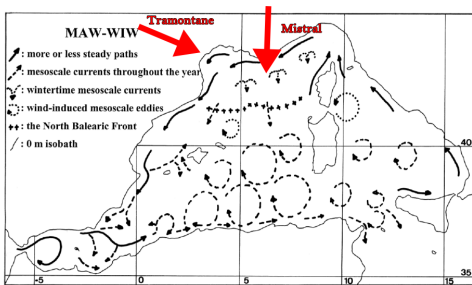


## Circulation and the Gulf of Lions



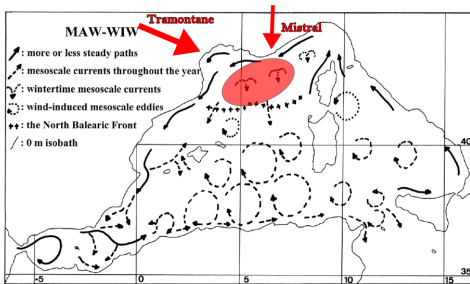
Circulation in the Western Mediterranean Sea,  
Milot 1999, JMS

# Circulation and the Gulf of Lions



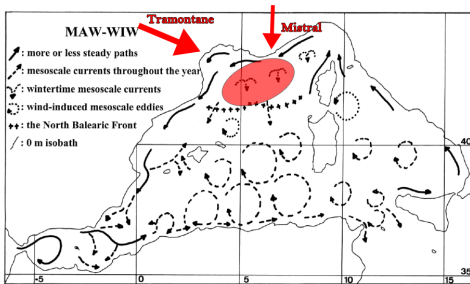
Circulation in the Western Mediterranean Sea,  
Millot 1999, JMS

# Circulation and the Gulf of Lions



Circulation in the Western Mediterranean Sea,  
Millot 1999, JMS

# Circulation and the Gulf of Lions

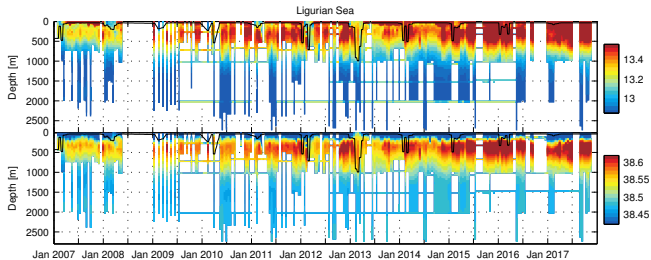
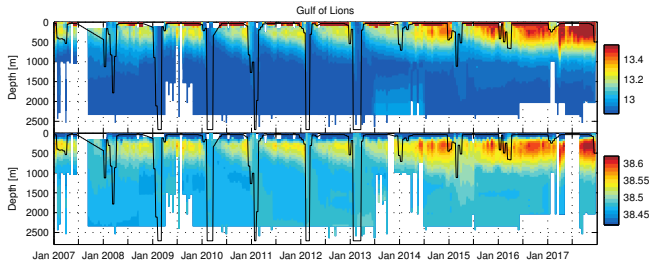


Circulation in the Western Mediterranean Sea,  
Milot 1999, JMS

## Deep convection

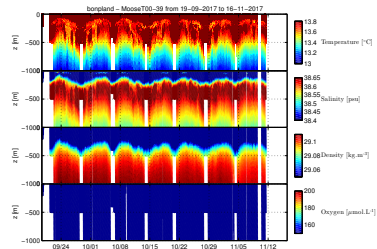
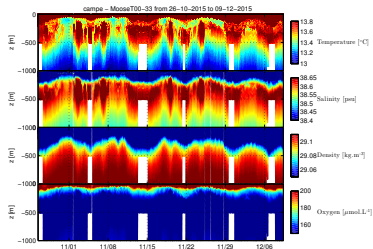
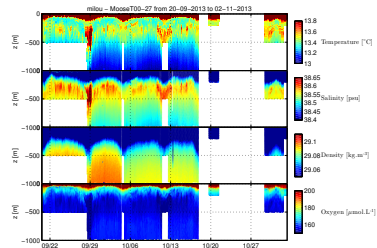
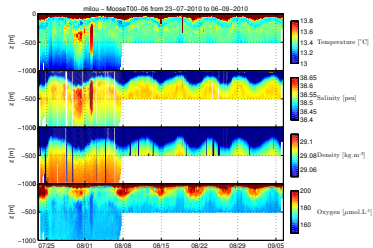
- ▶ thermohaline circulation
- ▶ ventilation
- ▶ hard to observe
- ▶ JGR special issue

# Mooring view : heat and salt content

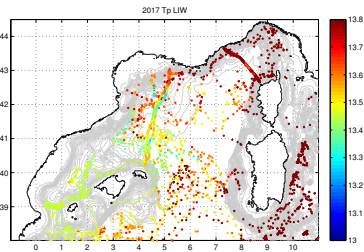
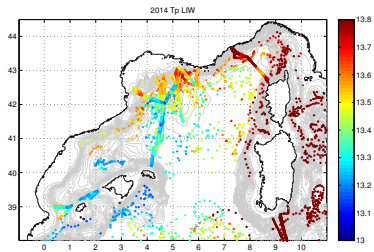
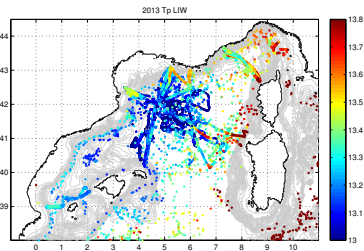
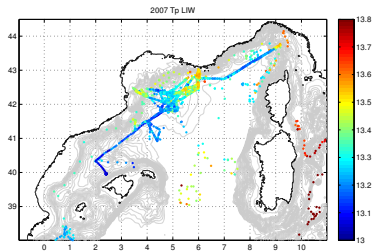




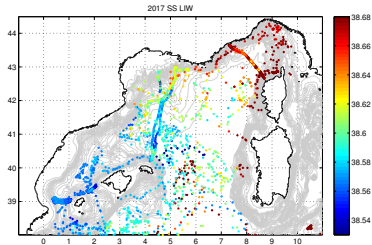
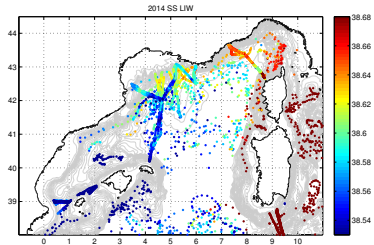
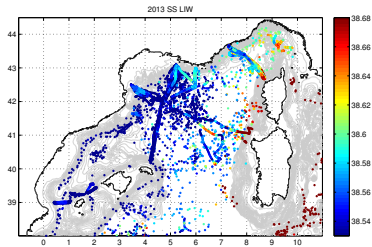
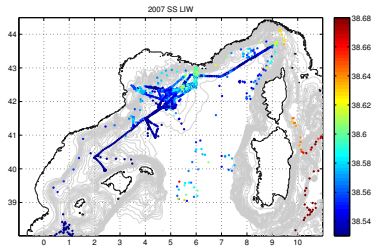
# Ligurian water properties



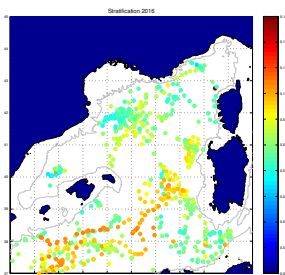
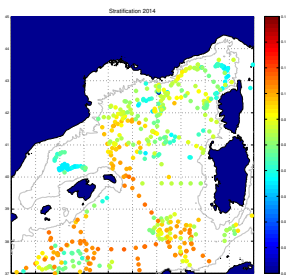
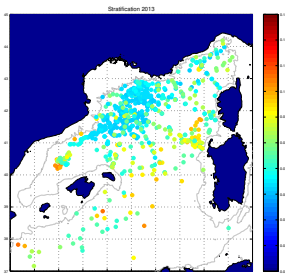
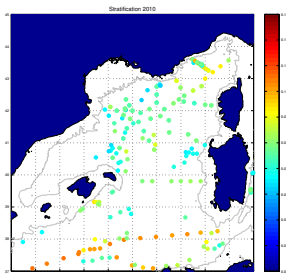
# LIW temperature



# LIW salinity

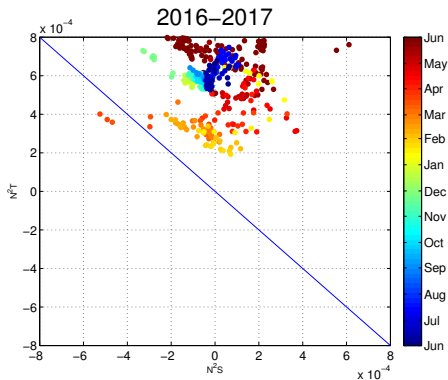
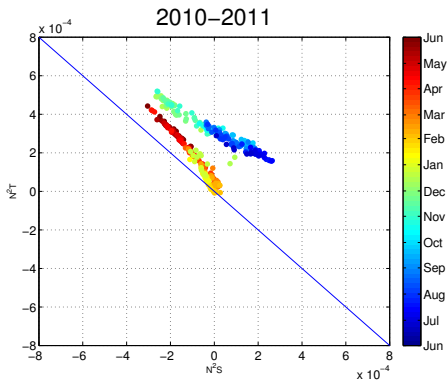


# Stratification



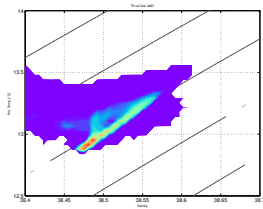
# Stratification

$$N_T^2 = -g\alpha d_z T \quad N_S^2 = g\beta d_z S$$

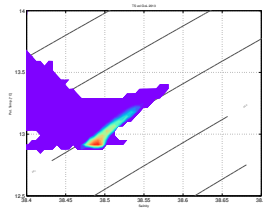


# Volumetric TS diagrams in the Gulf of Lions

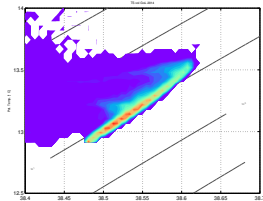
2007



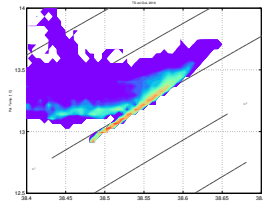
2013



2014

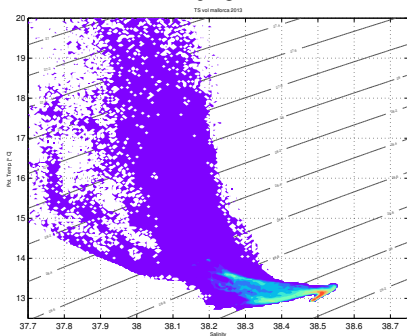


2016

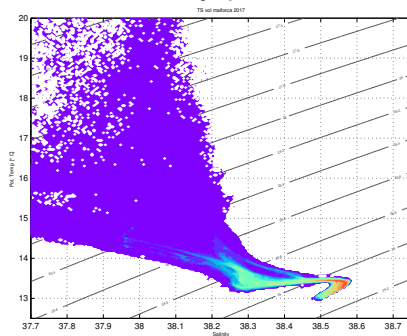


# Volumetric TS diagrams in the Balearic Sea

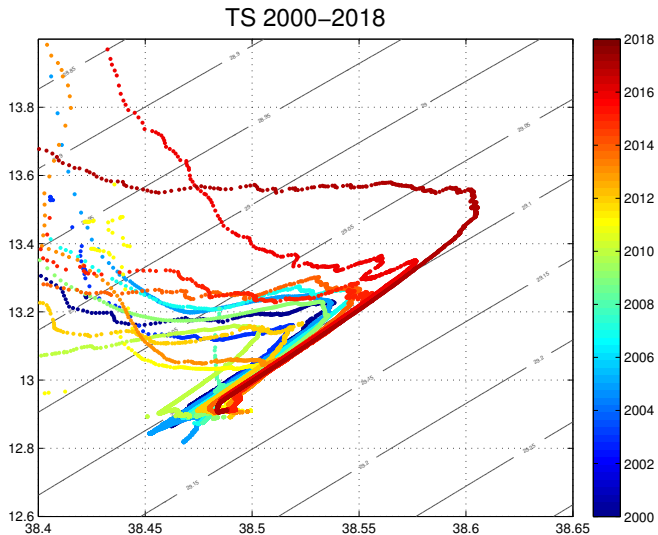
2013



2017

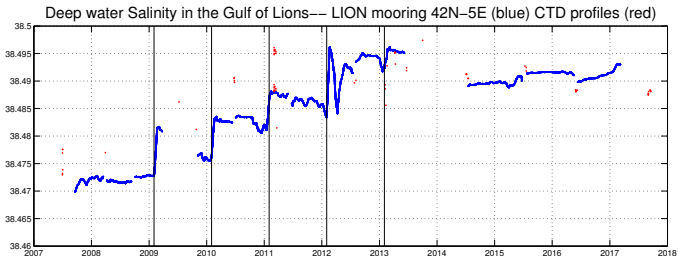
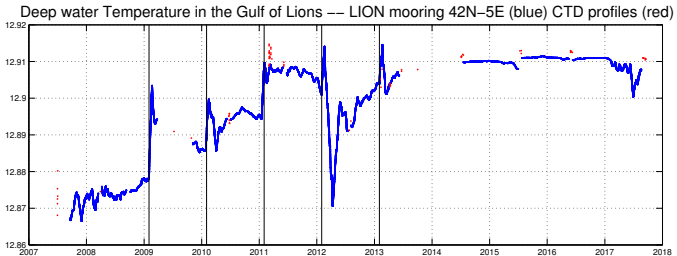


# Yearly TS diagrams in the Gulf of Lions

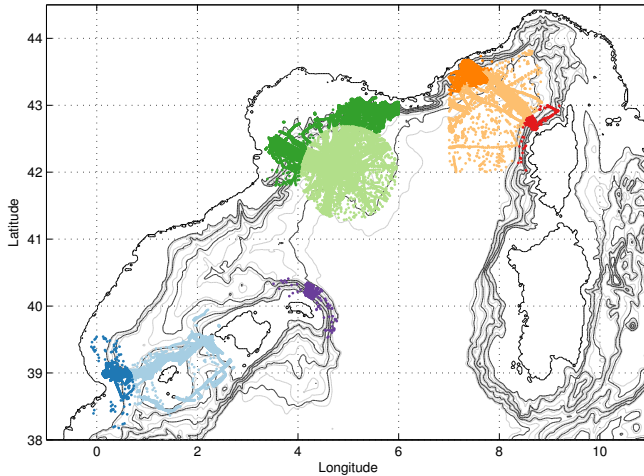




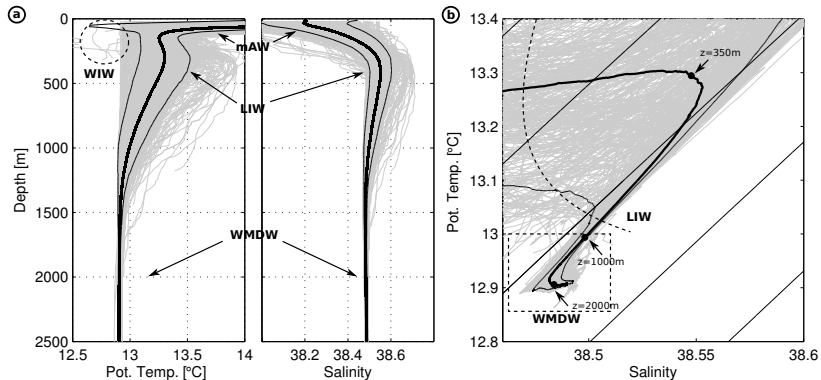
# Deep temperature and salinity



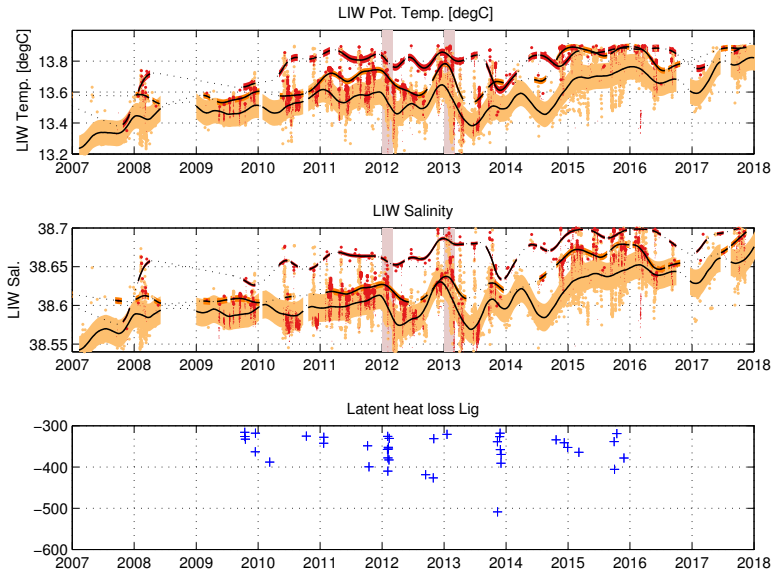
## Method - Paper in prep.



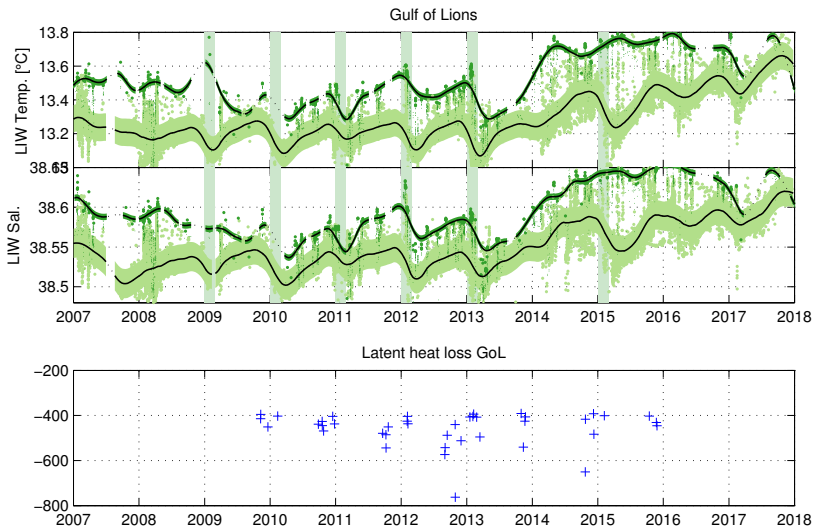
# The water masses



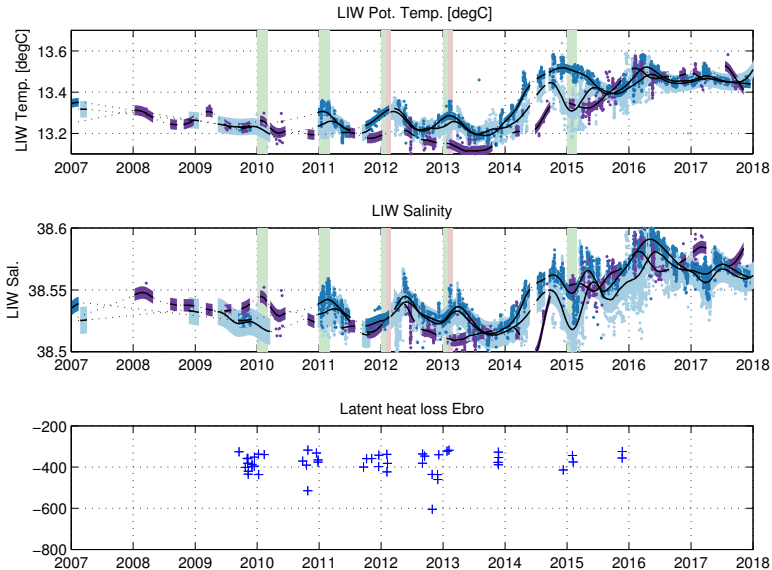
# LIW : Observations



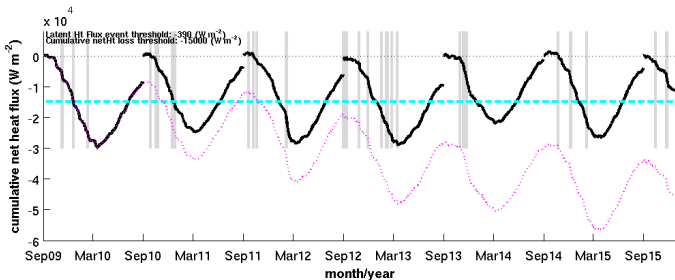
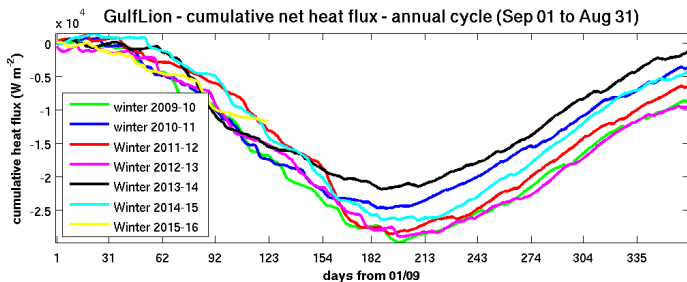
# LIW : Observations



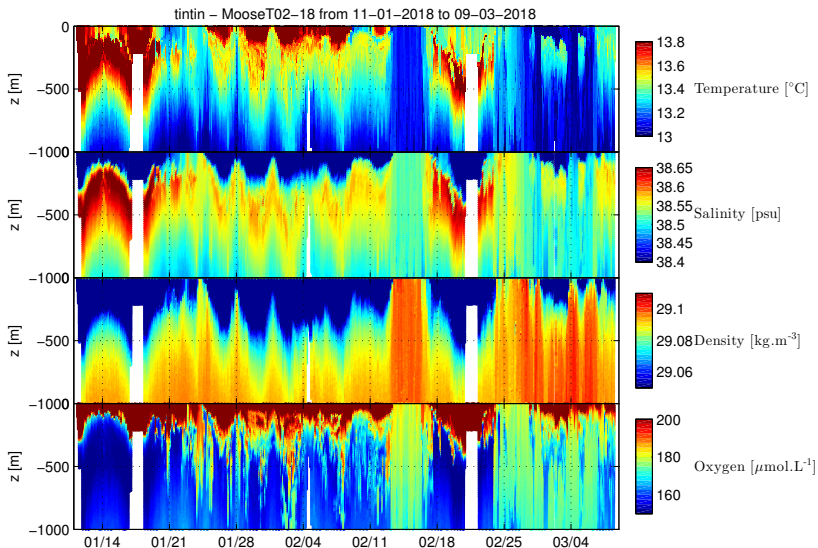
# LIW : Observations



# Fluxes in the Gulf of Lions



# 2018 Deep convective year !





## 2018 deep convection

- ▶ Argo floats and glider suggest  $13^{\circ}C - 38.5\text{psu}$  deep waters in the Gulf of Lions
- ▶ Ventilation for the first time in 4 years
- ▶ Ligurian sea ventilated as well (800m convection) - will take more time to refill the LIW content
  
- ▶ Warmer and Saltier deep waters than ever !

Thank you !