Salinity SVP SVP drifters
Cal/val SMOS/Aquarius
SPURS experiment

DBCP
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Gilles Reverdin Simon Morisset Antonio Lourenco, Nicolas Martin, Jacqueline Boutin (LOCEAN)
Pierre Blouch, Jean Rolland (CMM/CNRM)
Fabienne Gaillard and other colleagues (ILPO/FREMER)
Jordi Font, Joaquim Salvador, Jose Pelegri (ICM/CSIC)
Detlef Stammer, Meike-Sena Martins (ZMAW)

Luca Centurioni (SIO), Rick Lumpkin (NOAA/AOML)

www.locean-ipsl.upmc.fr/smos/drifters

Salinity drifters

- SVP-S (or SVP-BS) drifters

  - Sphere (~41 cm diameter, ~20 kg) with added C/T sensor (SBE37) below

  Drogue (~6 m long, centered at 15m depth) same as SVP; Attach (tether) can be different

- Measurements

  - Drogue presence (submergence)
  - Surface temperature sensor (since 2008 for Pacific Gyre)
  - Atmospheric pressure (and tendency)
  - Near-surface conductivity (salinity)

- Data transmission

  - Argos (PacificGyre, ICM), Iridium for Metocean drifters + GPS)

The early models (in 2005)

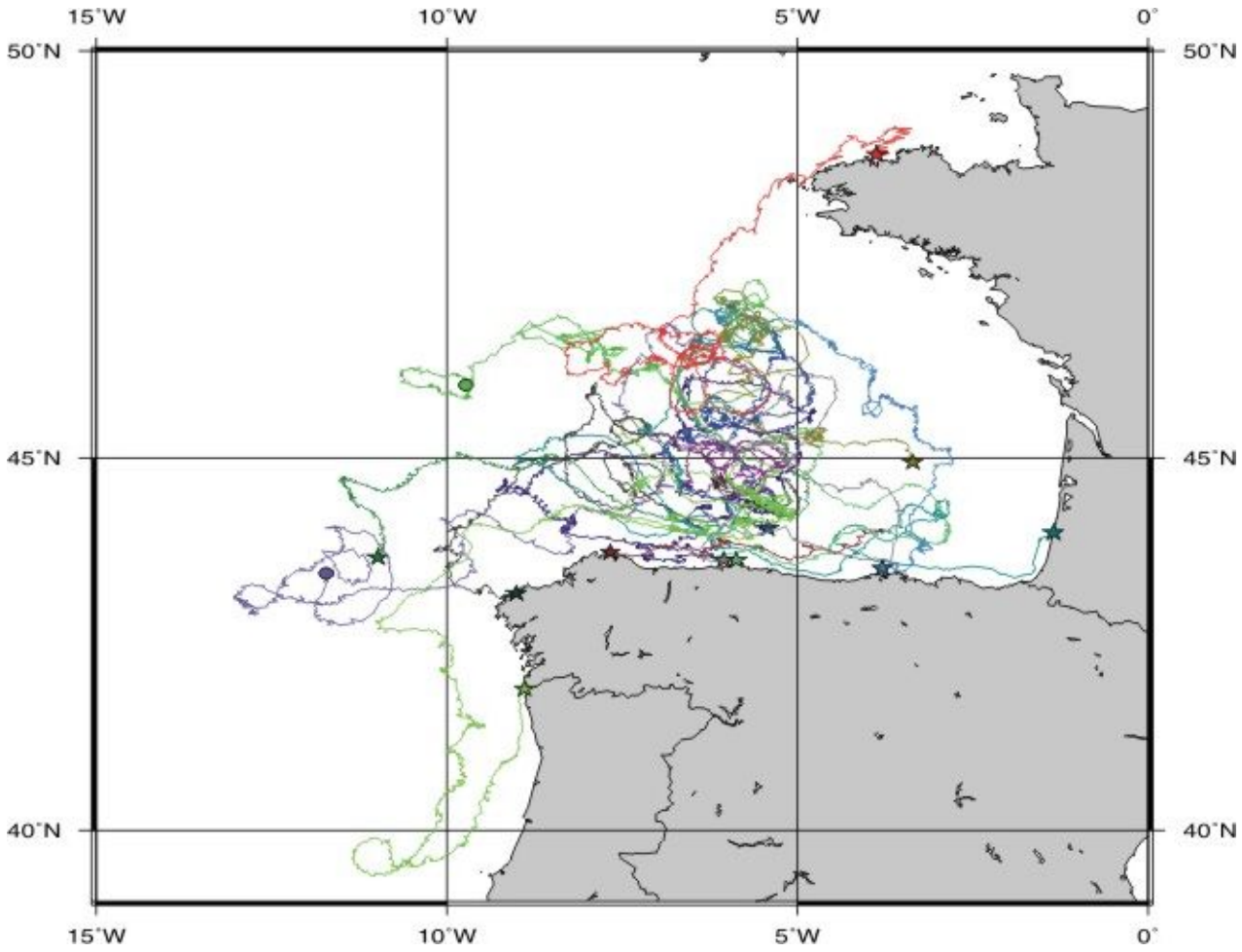
- SIO (SBE 37 SI)

- Metocean (SBE 47)

Since then, C/T SeaBird sensors are all unpumped SBE 37 SI sensors;
Also, comments on difference in T and C depths resulted tinsome small changes (sensors now closer)
Changes in drogue attachment + added SST measurement (Metocean), SLP measurements (PacificGyre);

Drifter trajectories

April - December 2005



Early results (2005)

- Salinity daily cycles resulting mostly from temperature stratification (C and T cells not at the same place, and is therefore mostly artificial) Requiŗes further study based on different sensors, with less distance T and C cells and better vertical resolution of temperature profile

- Comparisons at deployment (COSMOS)
  - Biases between -0.006 et + 0.008 psu for Metocean drifters
  - Biases between -0.007 and -0.026 psu for Pacific Gyre drifters
- Fouling and evolution of biases
  - -Up-to -0.017 psu in 80 days during spring bloom;
  - -However, average of –0.005 psu for this period
  - During summer (90 days), larger evolution observed up to –0040 psu

Drifters recovered by l'Argonaute December 2005

Biais: -0.010 à comparer à celui de CoSMOS2 +0.001

Biais de –0.005 à comparer à celui du déploiement – 0.009

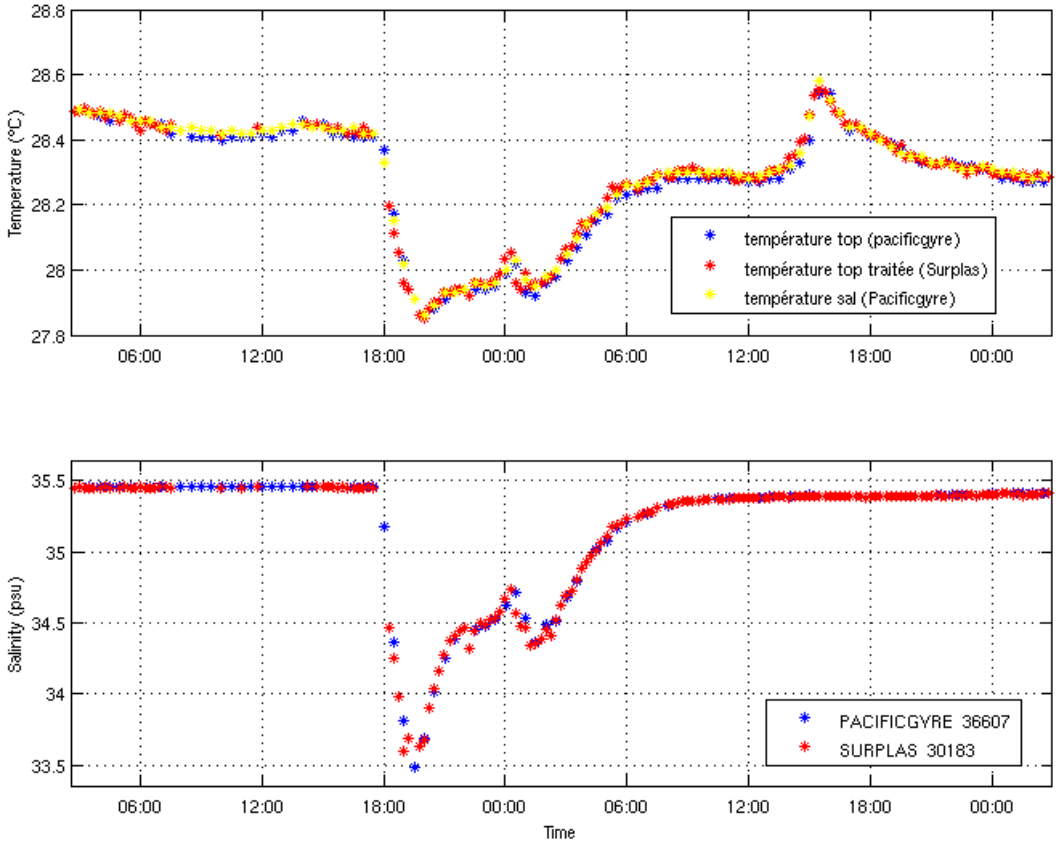
Deployments since 2008

type	number	Date - Navire	Position
#1 PG ZMAW	25 (-3)	Avril 2005 Thalassa	10 south tropical Pacific 15 Nordic Seas
#2 PG	31 (-5)	2008	Tropical oceans Bay of Biscay
#3 Metocean	32	2008-2010	Tropical and North Atlantic
#4 ICM/ CSIC	19	Dec 2010-July 2011	Tropical oceans

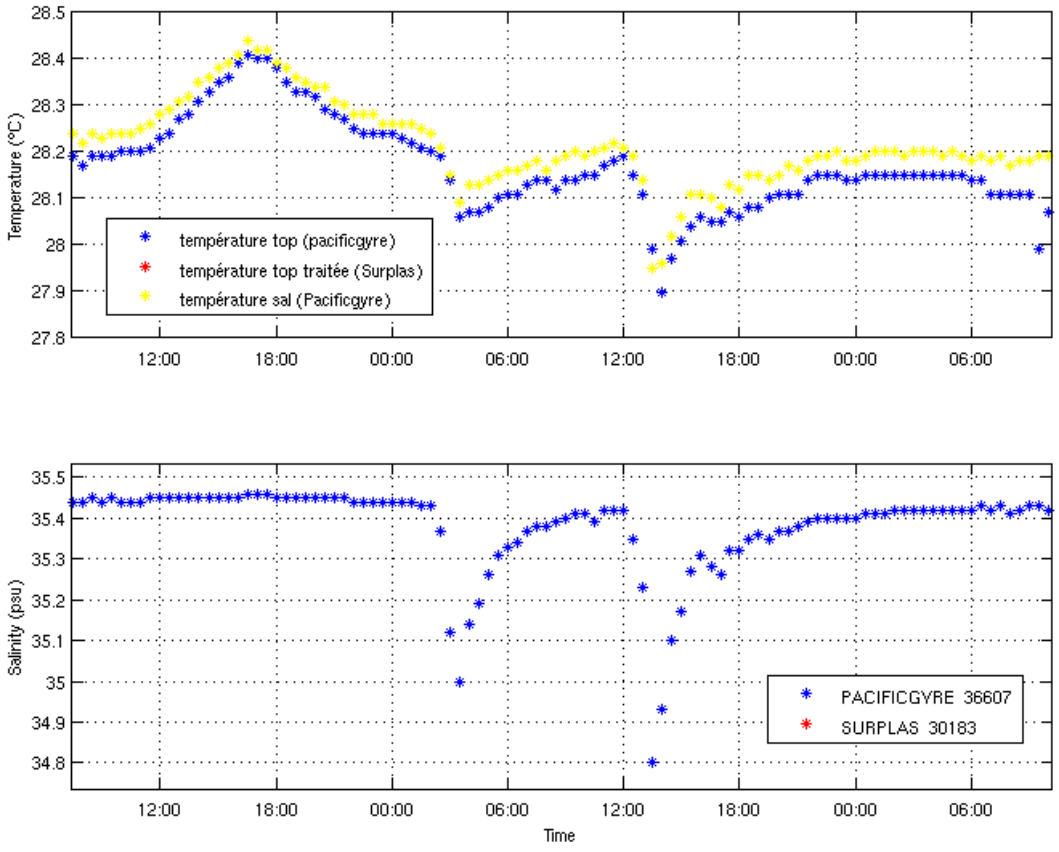
- 1 and 2 differ mostly in processing of data;
- Average over 5' (every 30' for #2)

#2 3 fished, 11 aground, 7 died within 3.5 months at sea (sink?, electronic problems or switch issue)
#3 4 fished, 7 aground
Presence of drogue short, in particular for #3 out of 19 drifters with life larger than 180 days, 5 loss within 60 days; 3 between 60 and 120 days, 3 between 120 and 180 days (more than half)

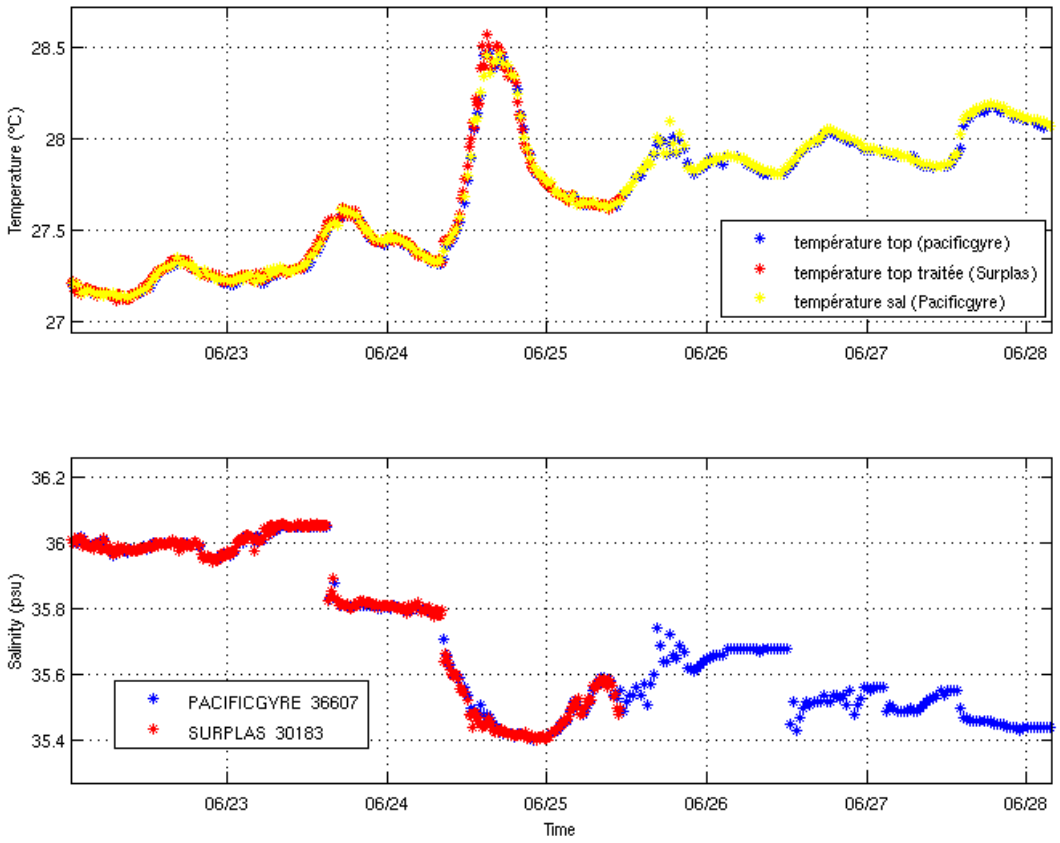
Large precipitation event



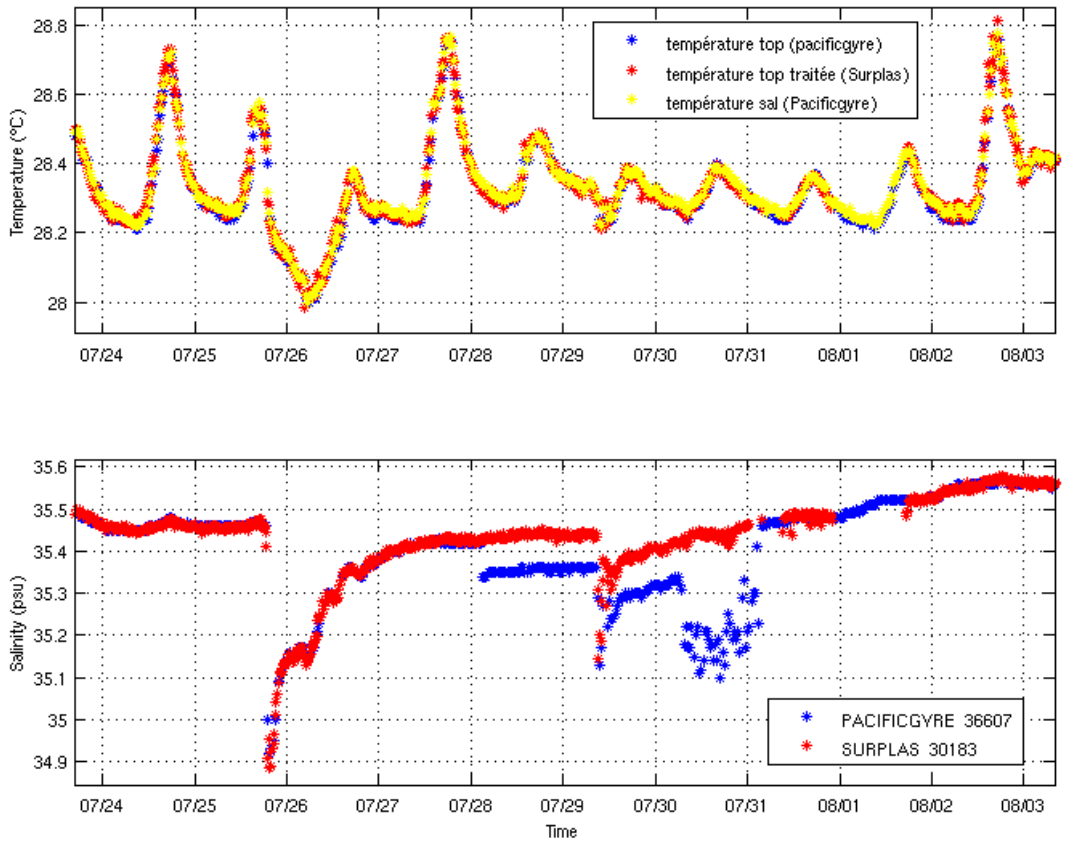
Smaller precipitations



Jumps in S, not in T (real)



(2 happened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température top traitée (Surplas)
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Temperature (°C)
28.8
28.6
28.4
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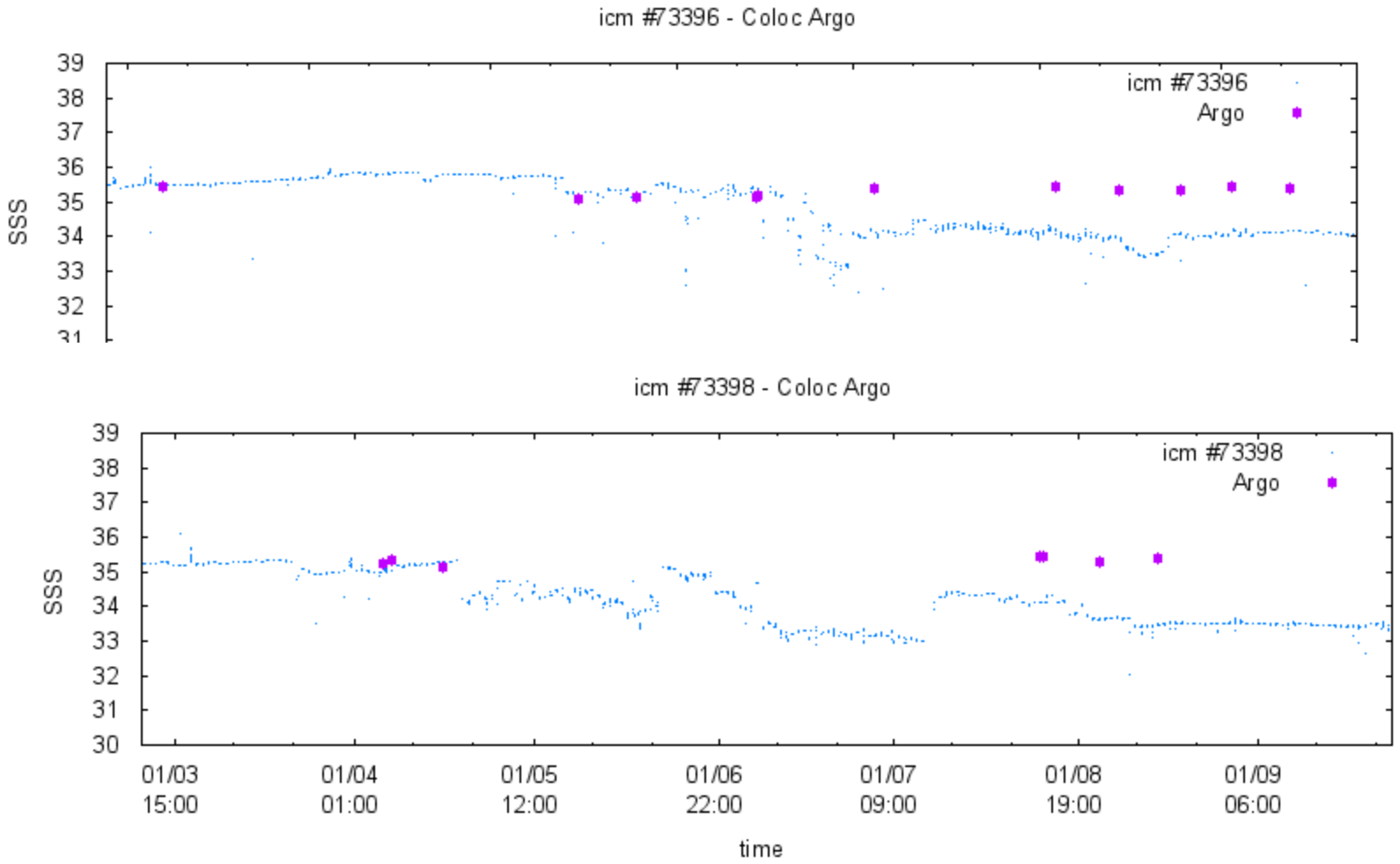
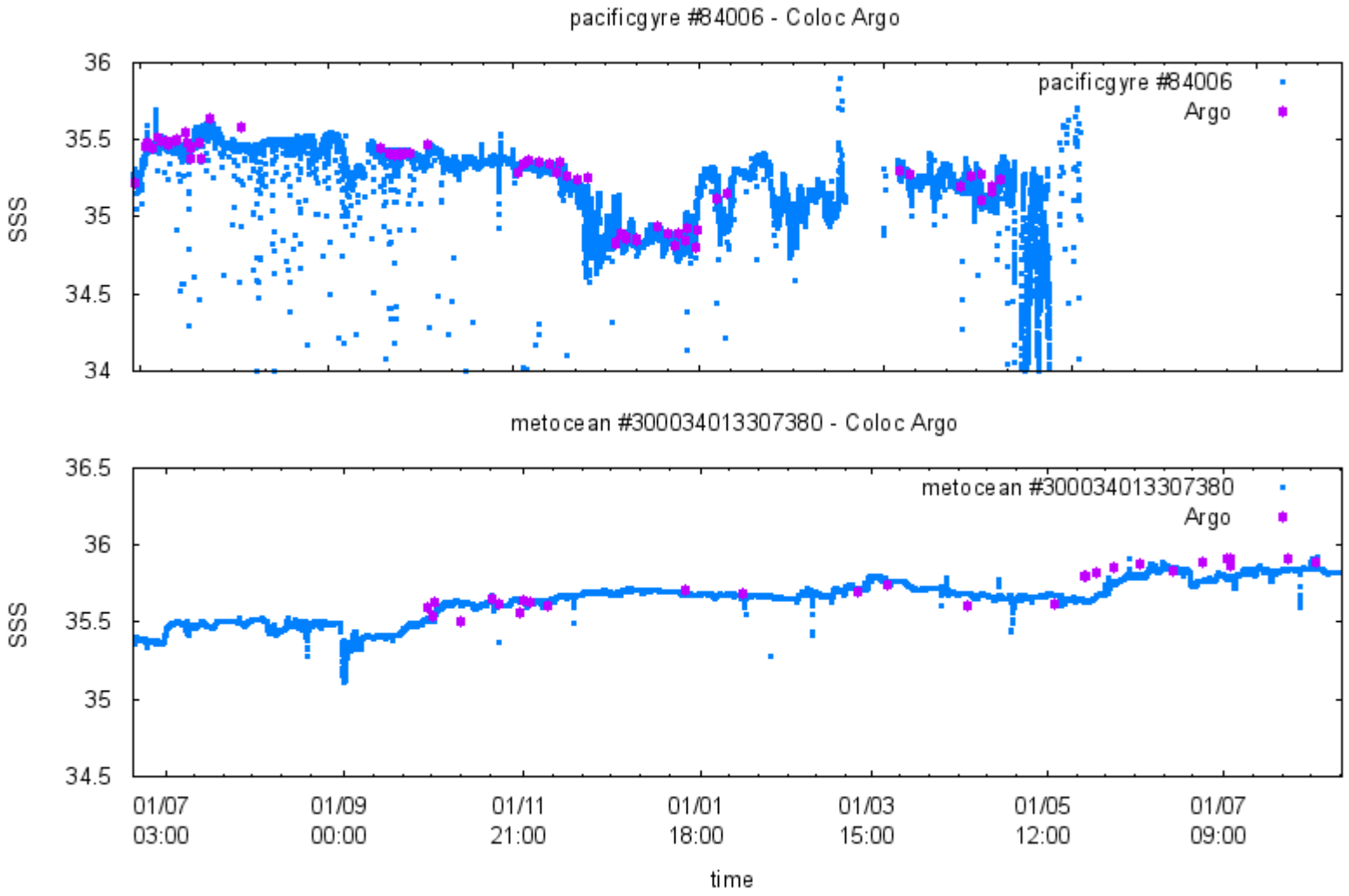
28
07/24
07/25
07/26
07/27
07/28
07/29
07/30
07/31
08/01
08/02
08/03
PACIFICGYRE 36607
SURPLAS 30183
Salinity (psu)
35.6
35.5
35.4
35.3
35.2
35.1
35
34.9
Time



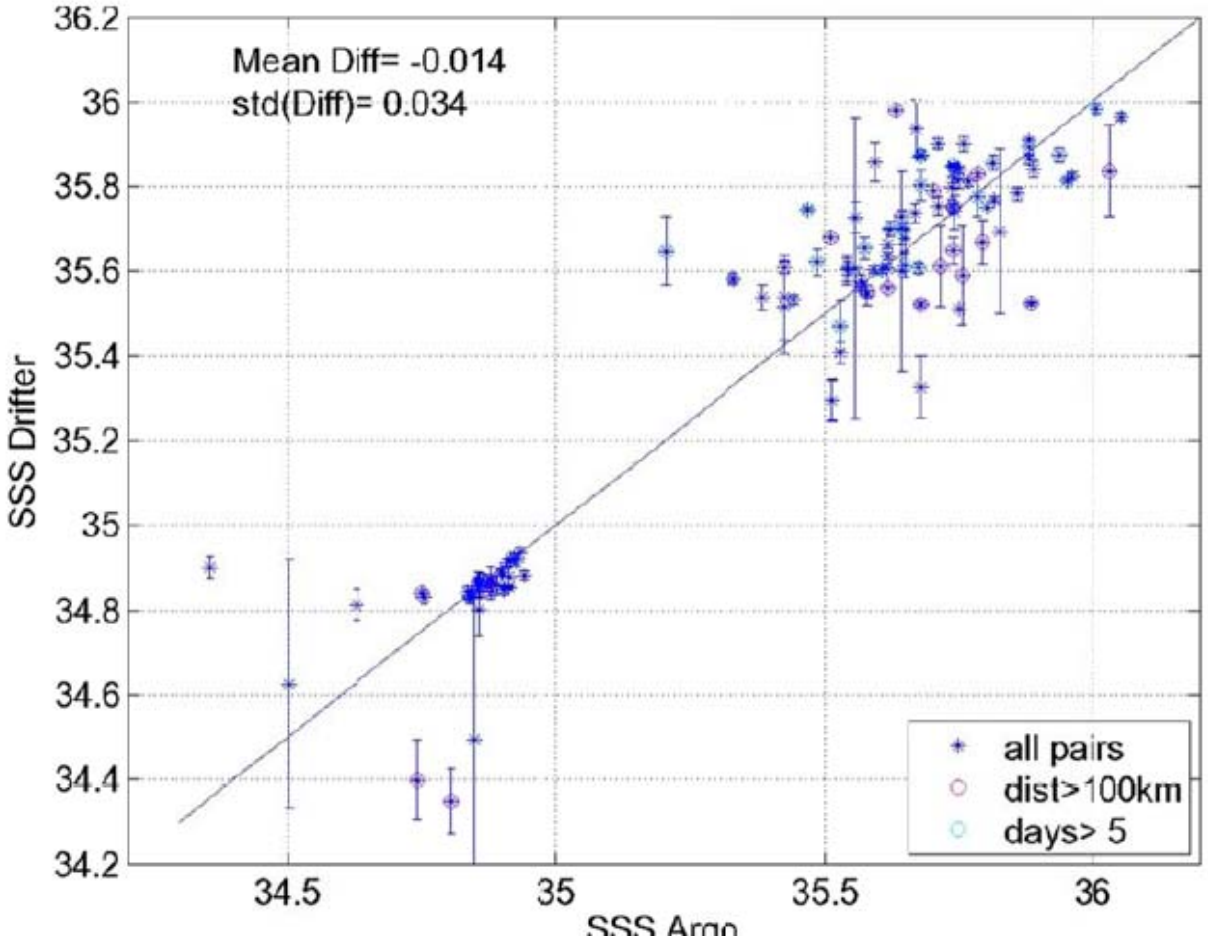
Comparison to ARGO data (ICM drifters without antifouling)



Noise: easy to remove

Slow drifts identified on 5 drifters

PG #1 (22 drifters)
Even without correction, not much scatter in comparison with ARGO



Conclusions

- The presence of an antifouling seems to be importance to reduce large drift (absence of antifouling on ICM/CSIC has negative results) Issue of drogue attachment and drogue loss (is it worse for SVP-B drifters?) losses due to fishing

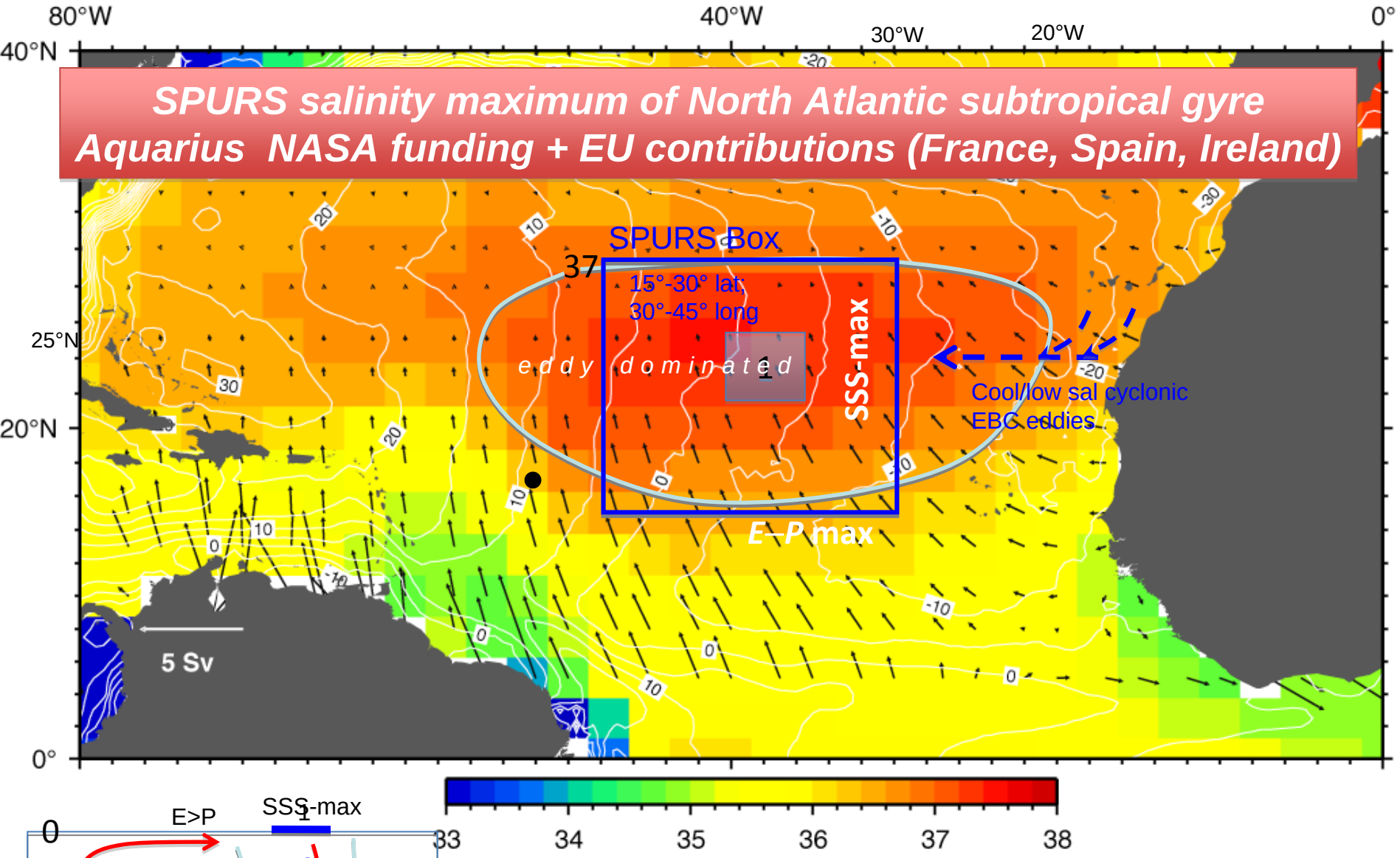
- Difficulty for full evaluation/correction of data,

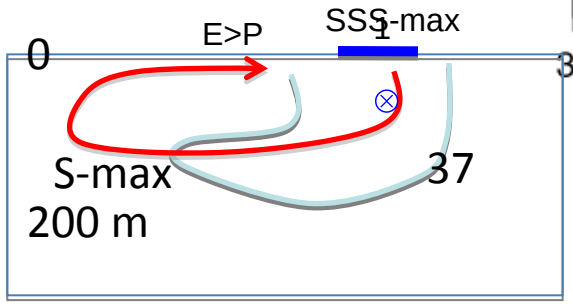
Slow S drifts (for long duration) can be identified from comparison to ARGO
Jumps can be real (and not always associated with T-jumps)
They can also be associated with objects stuck in the cell (temporarily or permanently)

- Can be used for study of response to precipitation of surface layer, large near surface stratification, evaluation of SST measurements

SPURS salinity maximum of North Atlantic subtropical gyre

Aquarius NASA funding + EU contributions (France, Spain, Ireland)





July 2012 – autumn 2013 ~80 SVP-S drifters

⊗ Cool/low sal cyclonic EBC eddies

Arrows: Ekman transport
White lines: absol dy topo