DEEP ARVOR

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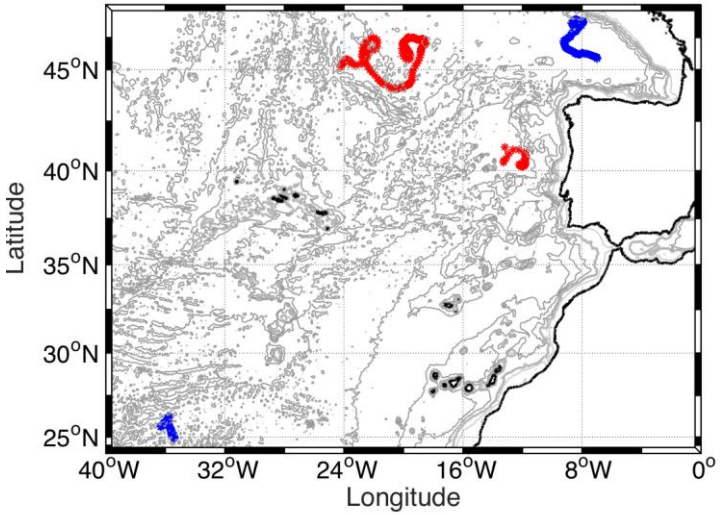
Deep Arvor

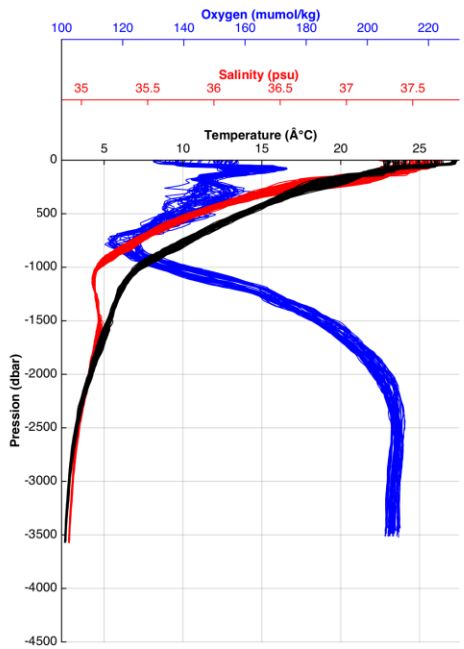
- Designed to achieve more than 150 profiles at 4000m depth
- SBE41CP CTD: recommandation of Seabird (adapted for 4000m) continuously pumping during ascent, sampling every meter (programmable)
- Oxygen measurement option (4330 optode)
- Iridium & GPS
- 26kg weight
- Two 3500 dbar models deployed in 2012 and 2013
- Two 4000 m (4120 db) industrials prototypes deployed in 2014
- Twelve 4000 m floats to be deployed in 2015 and 2016

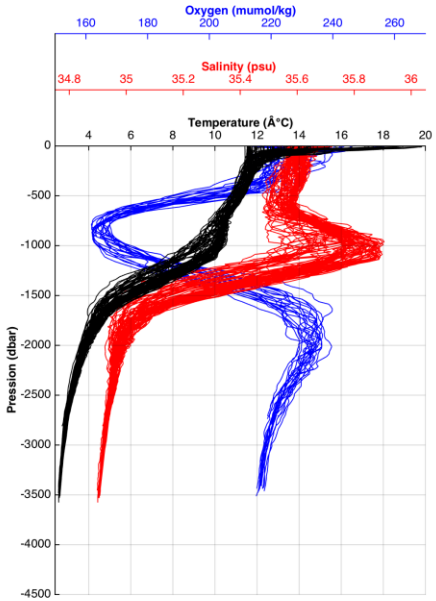
Deep Arvor - Geovide cruise (june 2014)

First prototypes (3500 db)



First prototypes (Arvor 3500), CTD-DO, deployment in 2012 and 2013





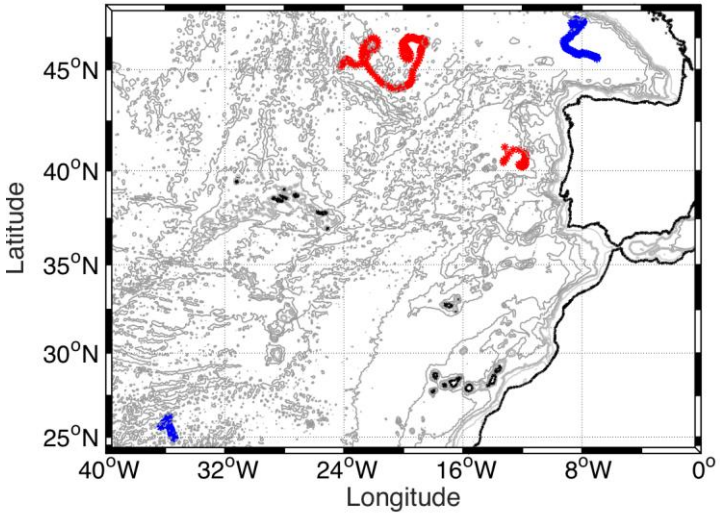
Deep-Arvor #1

62 cycles

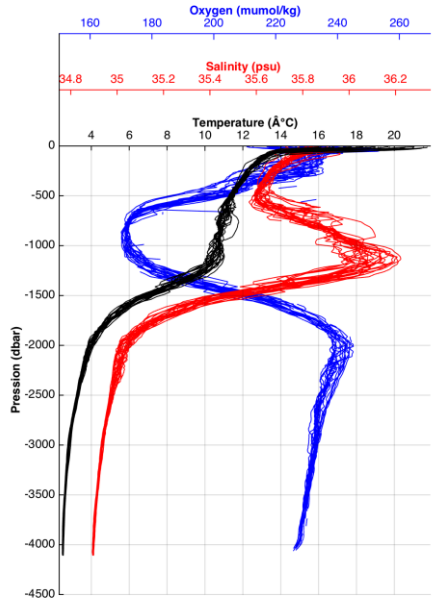
Deep-Arvor #2

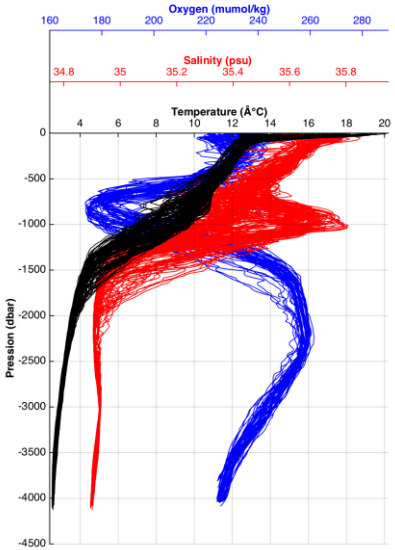
89 cycles

Industrials prototypes (4000 m)



Industrials prototypes (4000 m), CTD+DO, deployment in May 2014





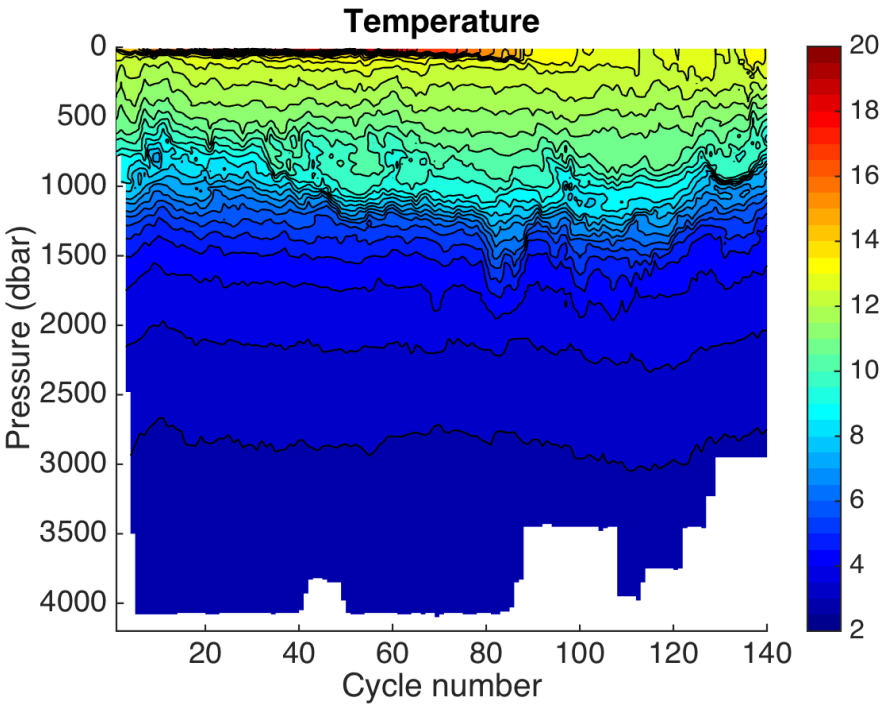
Deep-Arvor #3

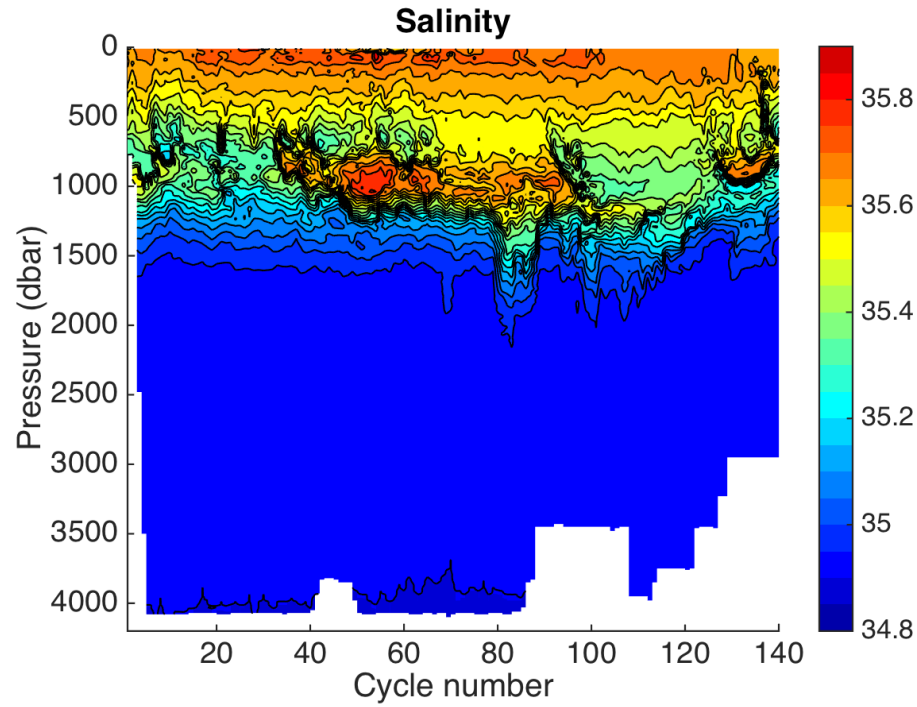
30 cycles (10-day cycle)

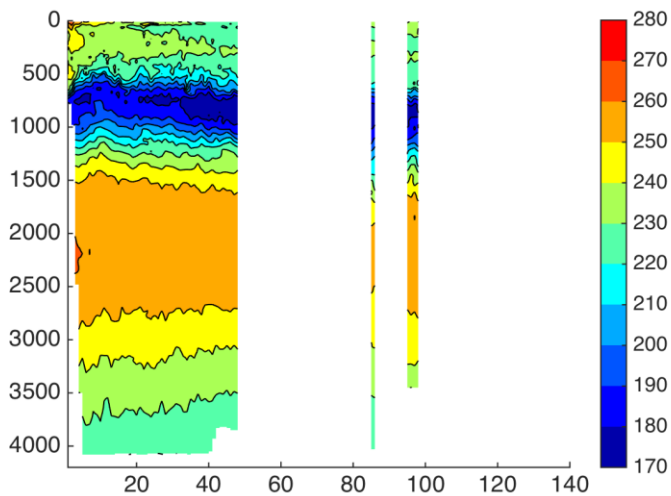
Deep-Arvor #4

140 cycles (2-day cycle)

Industrials prototypes (4000 m)







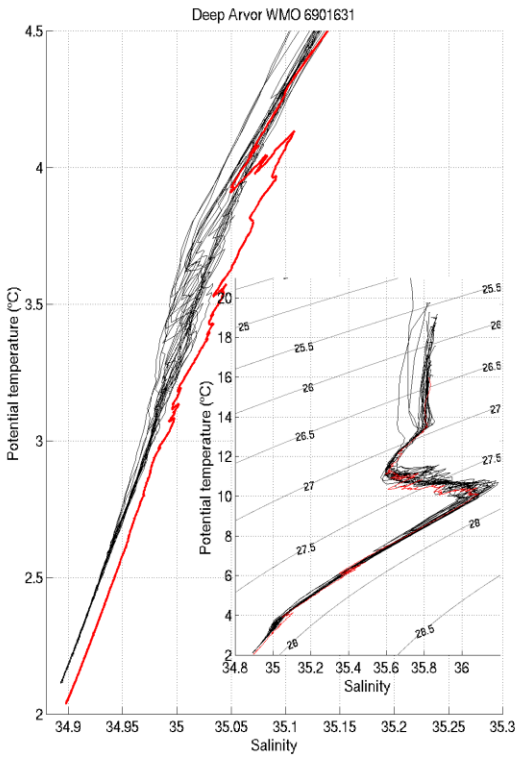
Deep-Arvor #4 :

140 cycles (2-day cycle)

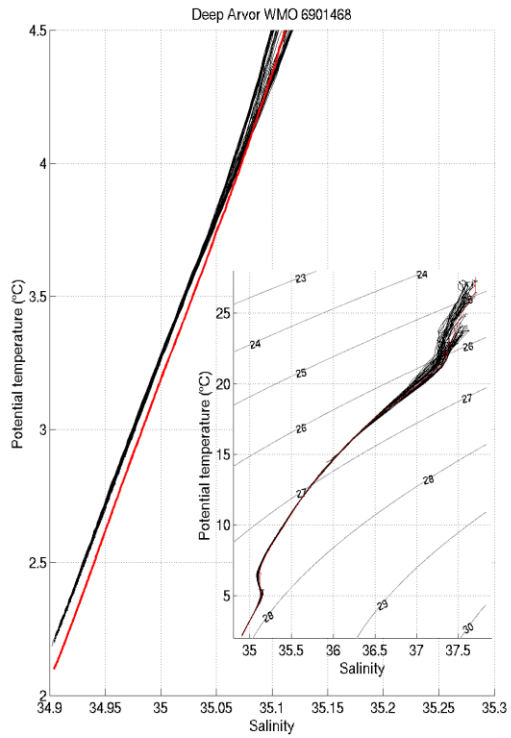
Saline bias of - 0.01 / -0.02 psu

- Comparison to reference profile acquired at deployment

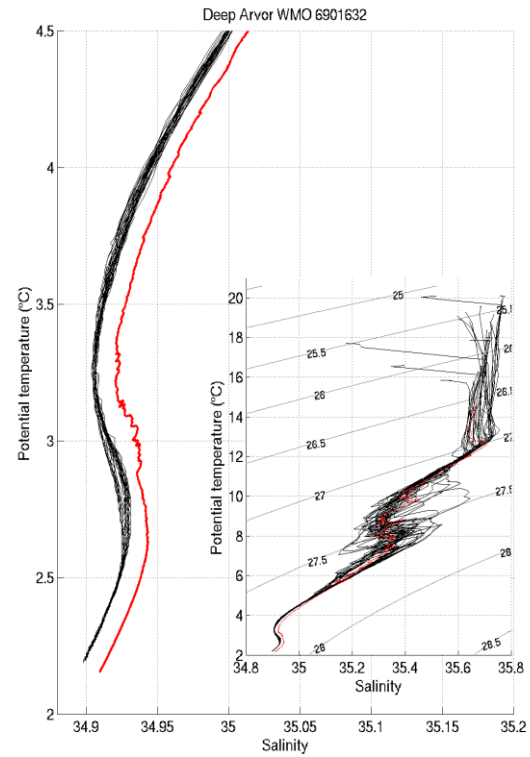
Deep-Arvor 1



Deep-Arvor 3

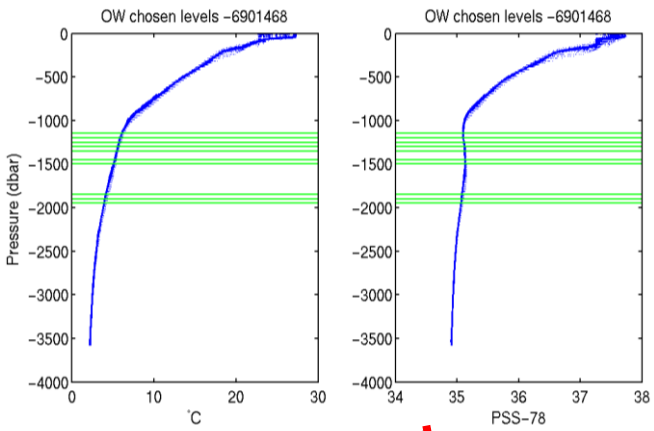


Deep-Arvor 4

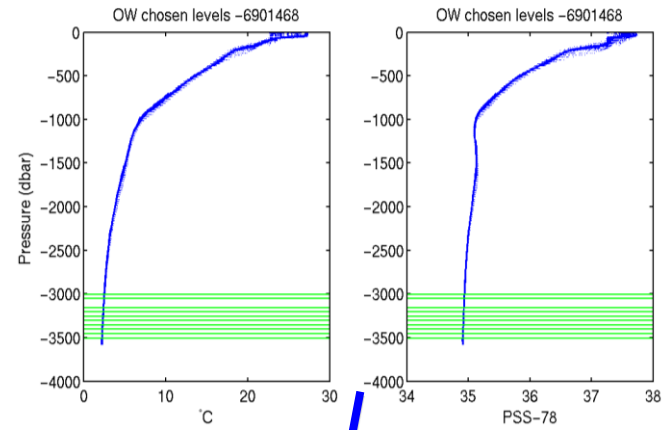


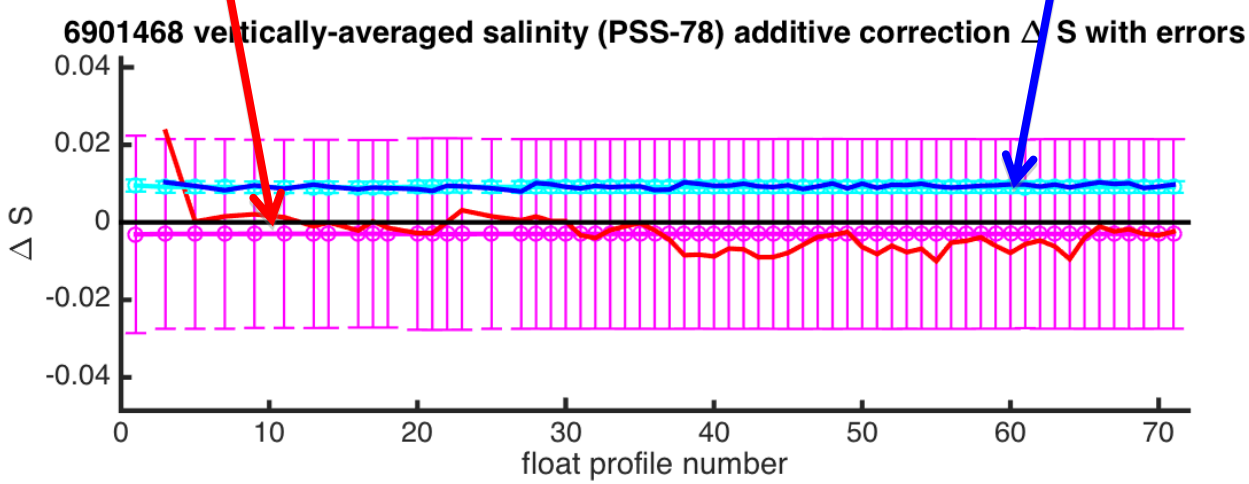
Saline bias

- Not detected when considering the upper 2000 m layer
- Detected when considering layers below 2000 m

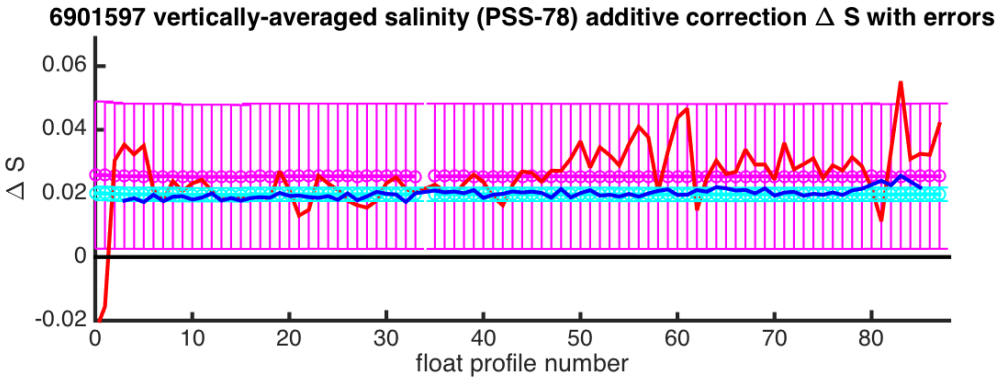


6901468

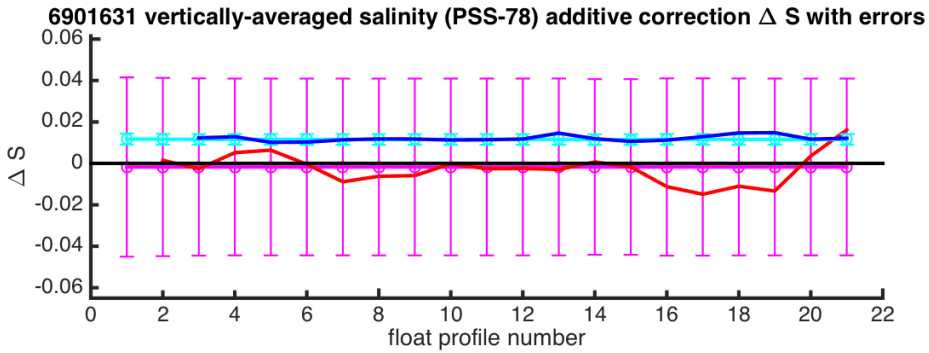




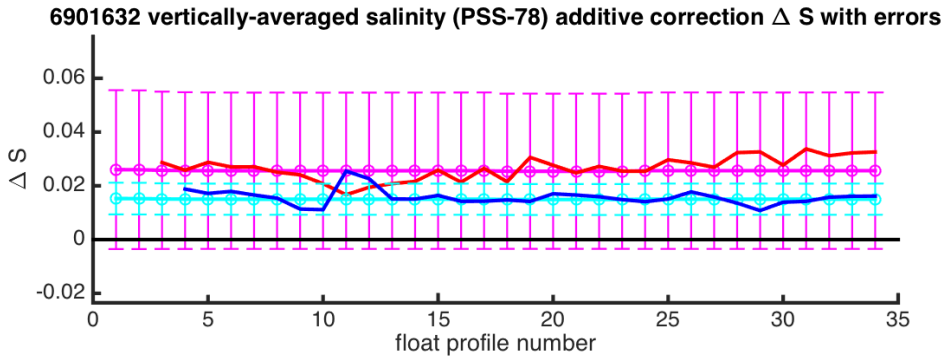
Saline bias



Deep Arvor 2



Deep Arvor 3

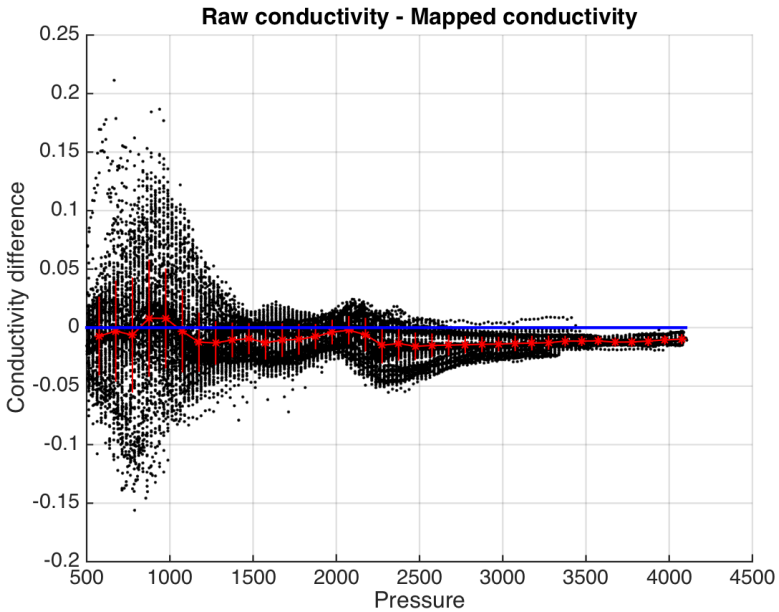


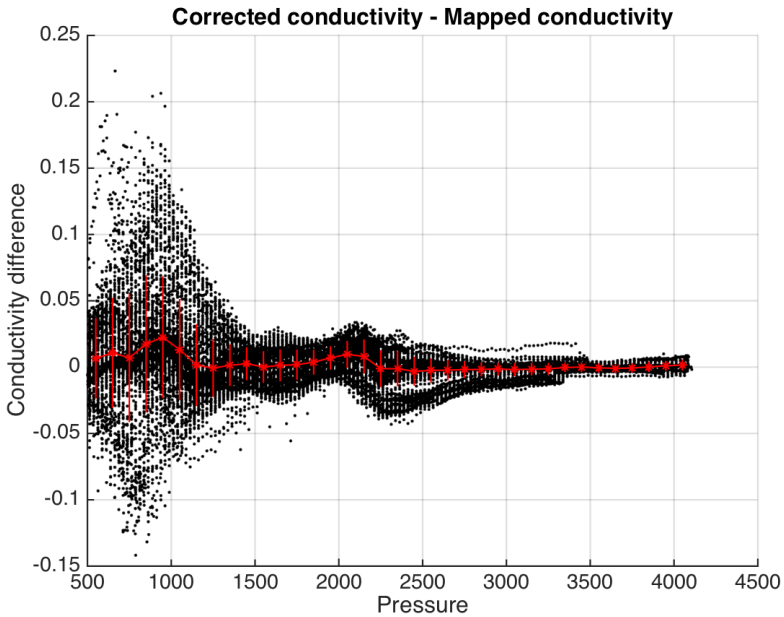
Deep Arvor 4

Saline bias
Correction estimates

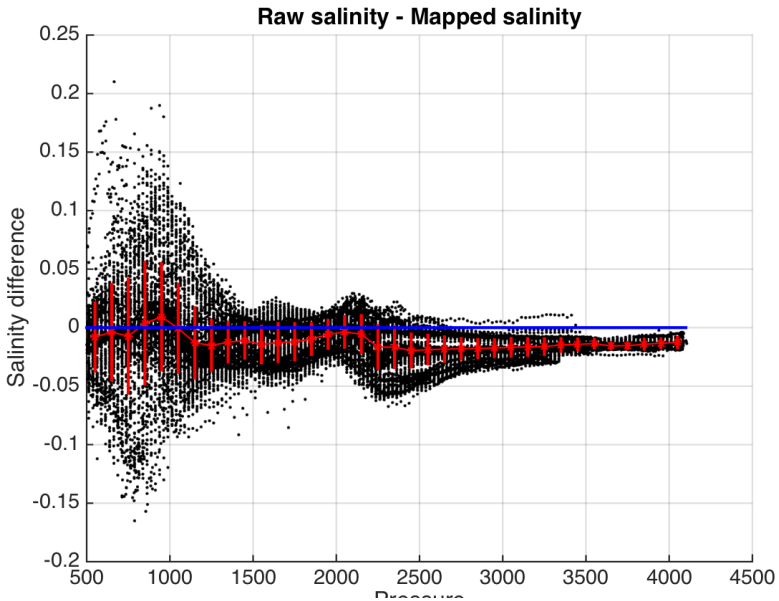
	Layers deeper than 3000 dbar		Layers shallower than 2000 dbar
Float WMO number	Comparison with reference CTD	OW method	OW method
6901468	0.010	0.009 ± 0.002	-0.003 ±0.025
6901597		0.020 ± 0.002	0.025 ± 0.023
6901631	0.013	0.012 ± 0.003	-0.002 ± 0.043
6901632	0.014	0.015 ± 0.006	0.026 ± 0.029

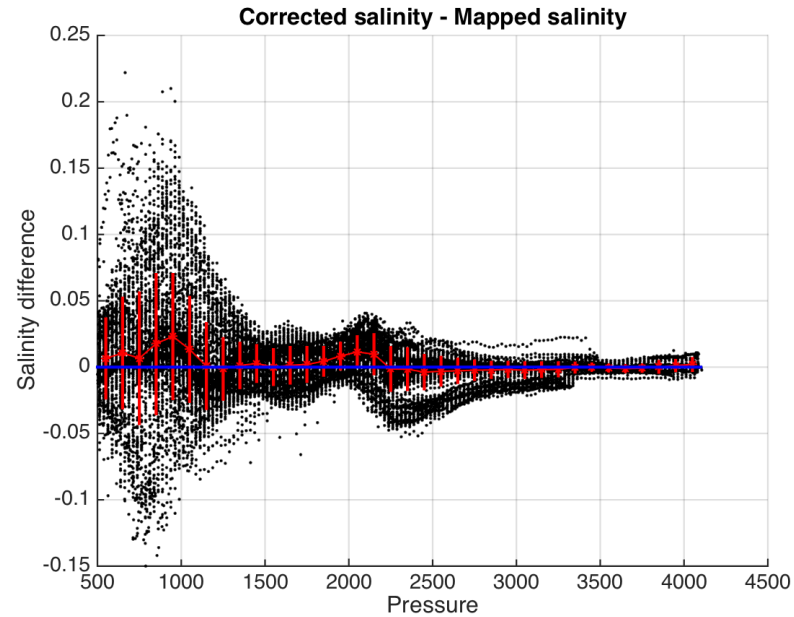
Pressure dependence

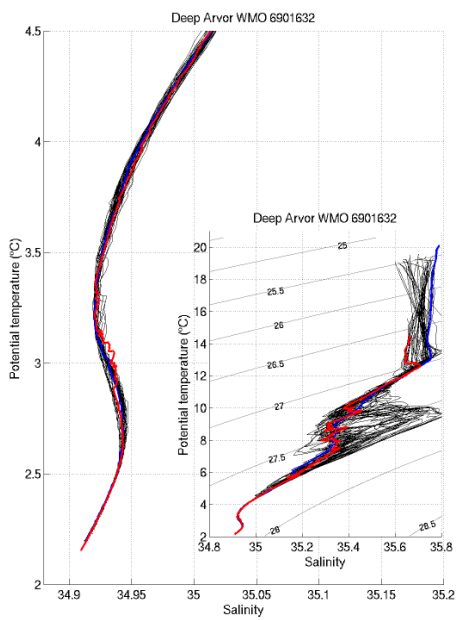




Pressure dependence

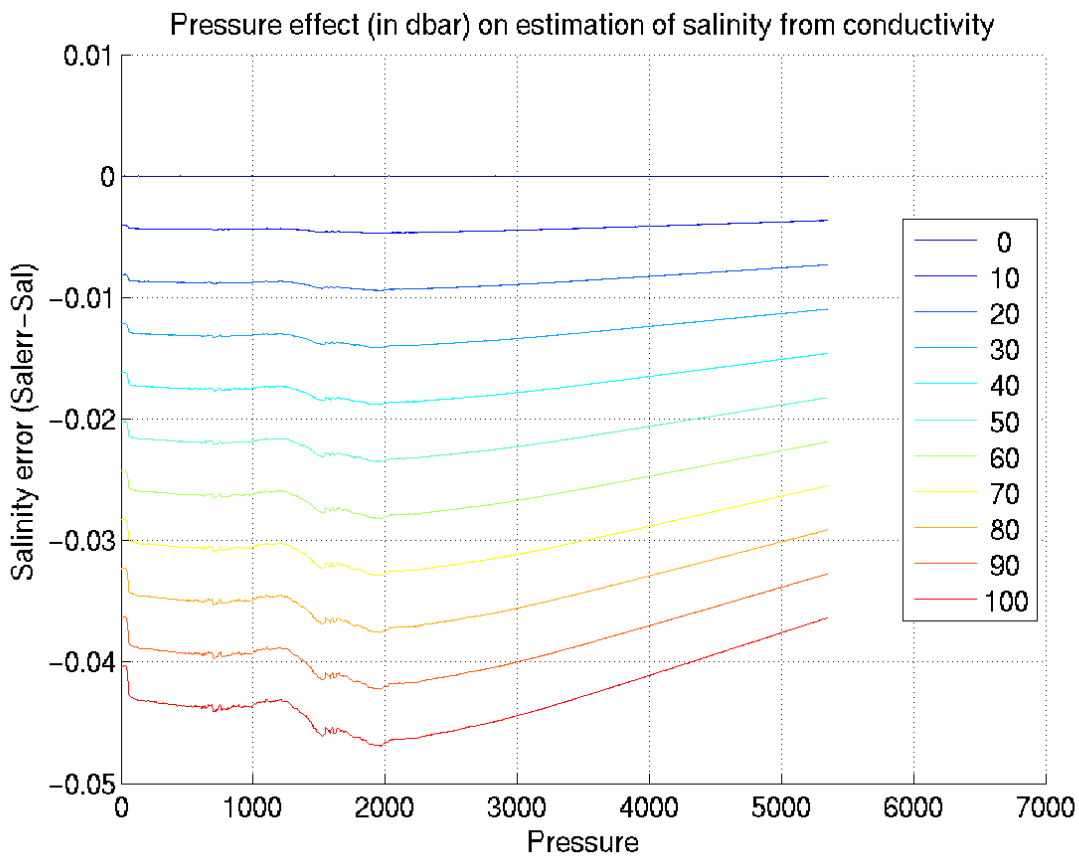






No obvious pressure dependence of the conductivity sensor detected with our 4 floats
Need more floats to confirm this

Conclusion

- Deep Arvor: 4000 m/4120db, SBE41CP, O2 measurements, target: 150 cycles (without O2)
- Successful deployments of 4 Deep-Arvor floats
- One float (still active) already realized 140 cycles (more than 1/3 profiles with O2)
- Systematic underestimation of the salinity by 0.01-0.02, apparently not pressure dependent
- Saline bias not detected when considering 0-2000db layer
- Saline bias easily detected and corrected with deep measurements➔ deep measurements will help improve the overall quality of upper layer salinity data

Kistler 7000 dbar used with Deep Arvor 4000m
Accuracy is ± 0.1% of full scale range or 7db.
Stability is 0.05% of full scale range or 3.5db.