

Comparison of results from high resolution simulations with observed sections in the north and tropical Atlantic.

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Collaborator: F. Schott

Models:

HYCOM Sig2* expt 11.4 year 8

HYCOM Nowcast Oct 2003-Sep 2004

MICOM ECMWF 1979-81

Schott et al's observations:

43°N

JPO 2004

Equatorial Atlantic:

35°W

GRL 2003

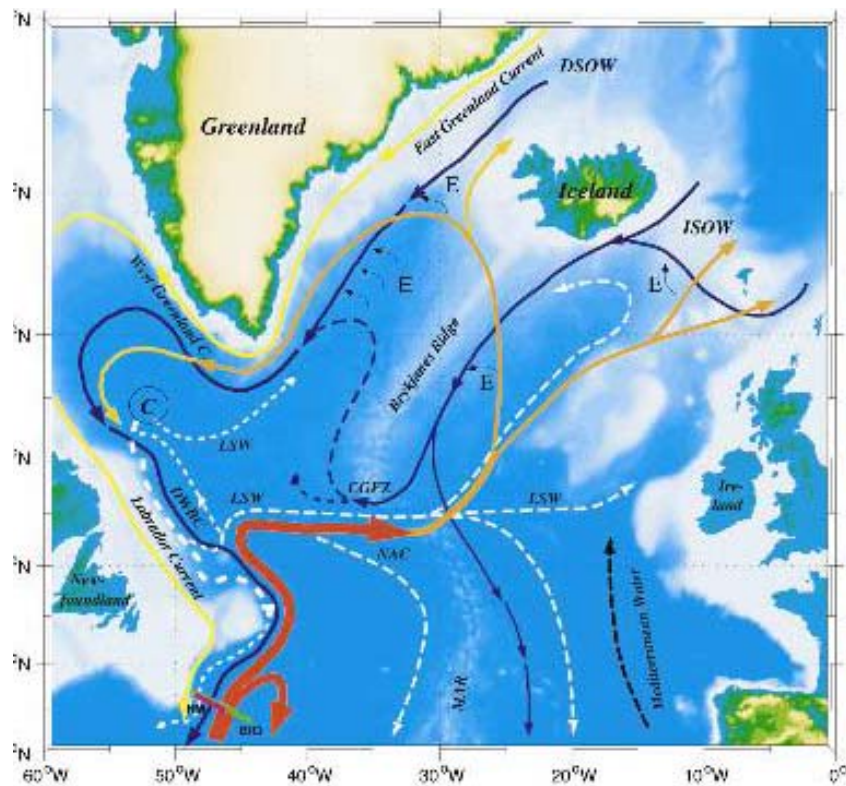
23°W

5°S

GRL 2002

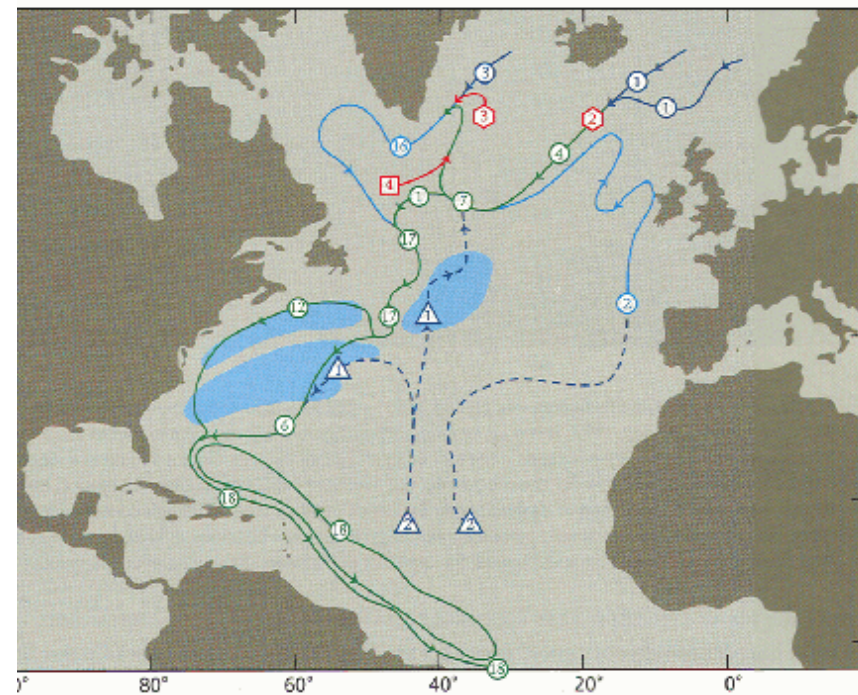
11°S

Schott et al., 2004

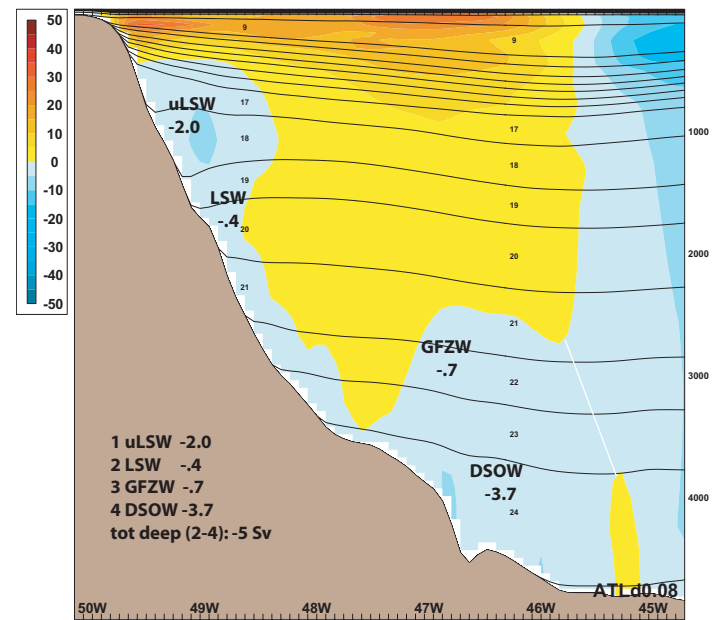


IFM , BIO moorings location

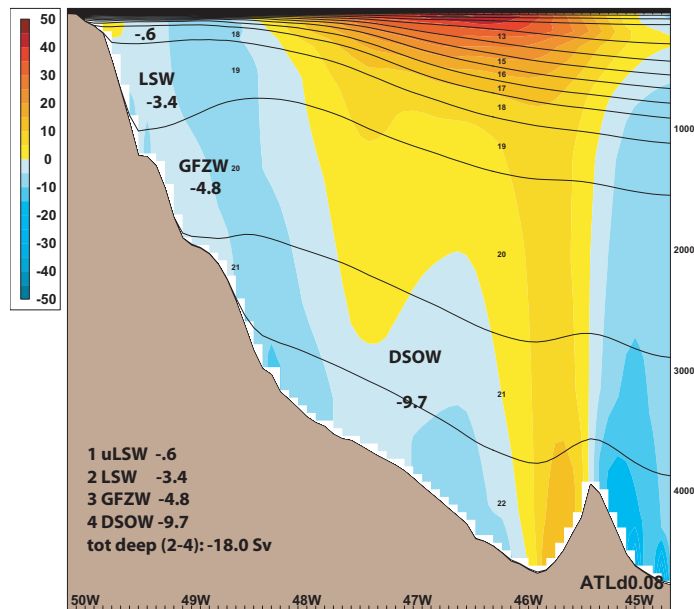
Schmitz, 1996



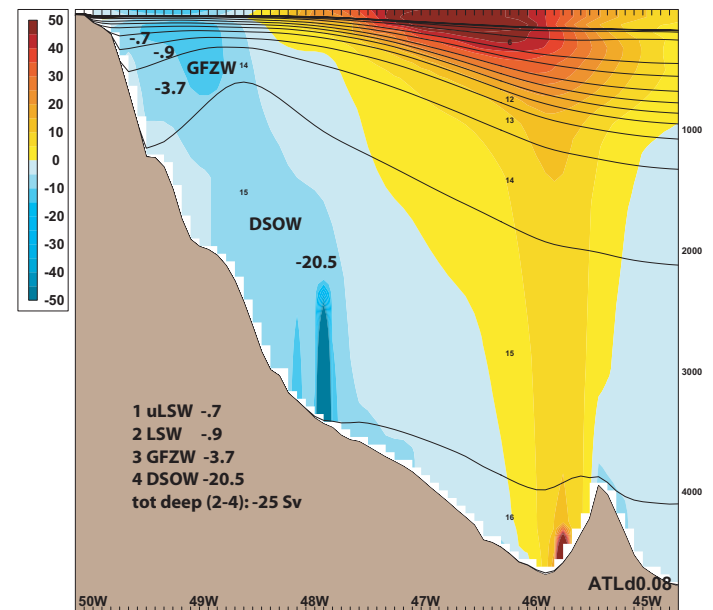
v-velocity zonal sec. 43.03n mean: 7.00- 8.00 [11.4H]



v-velocity zonal sec. 43.03n mean: 2003.67-2004.67 [09.1H]

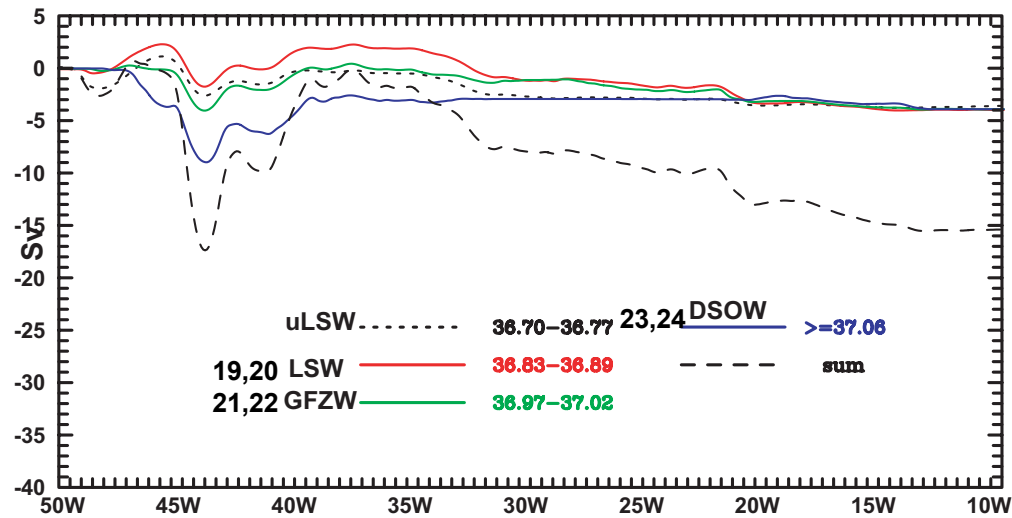
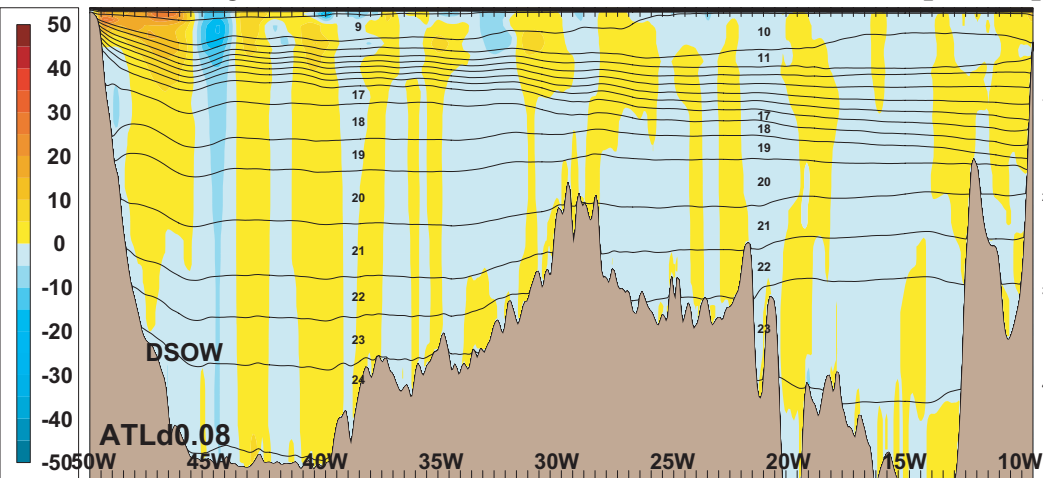


v-velocity zonal sec. 43.03n mean: 1981.00-1982.00 [01.0H]

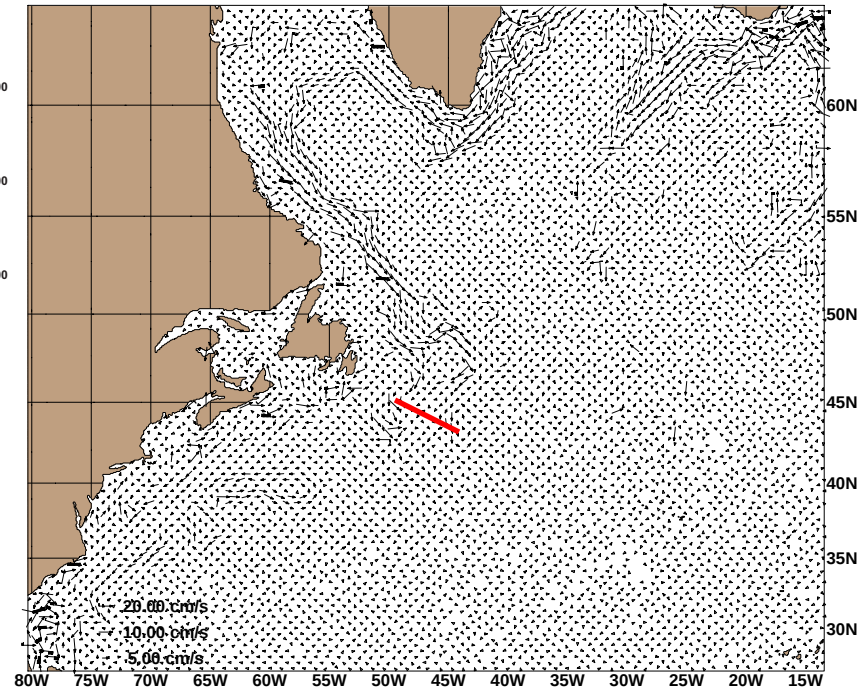


43°N, sig2*

v-velocity zonal sec. 43.03n mean: 7.00- 8.00 [11.4H]

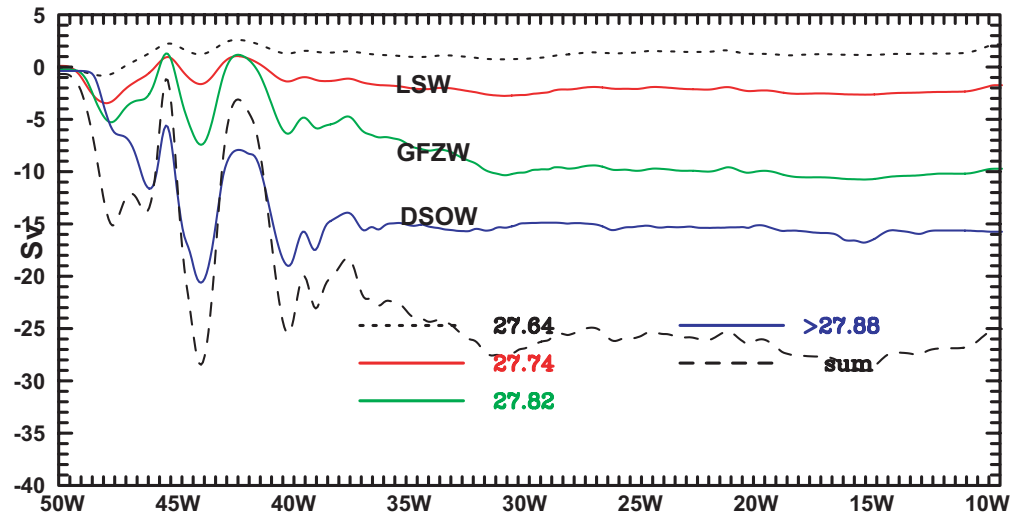
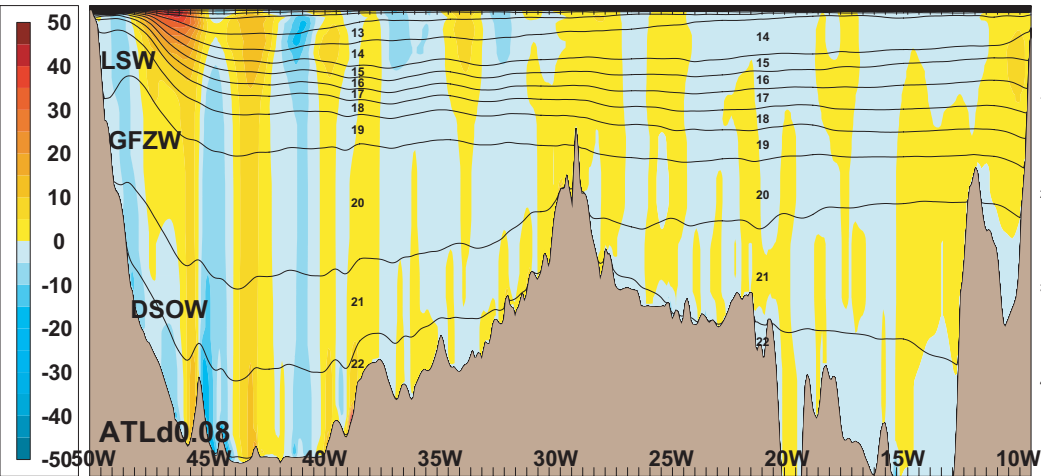


layer=23 velocity mean: 7.00- 8.00 [11.4H]

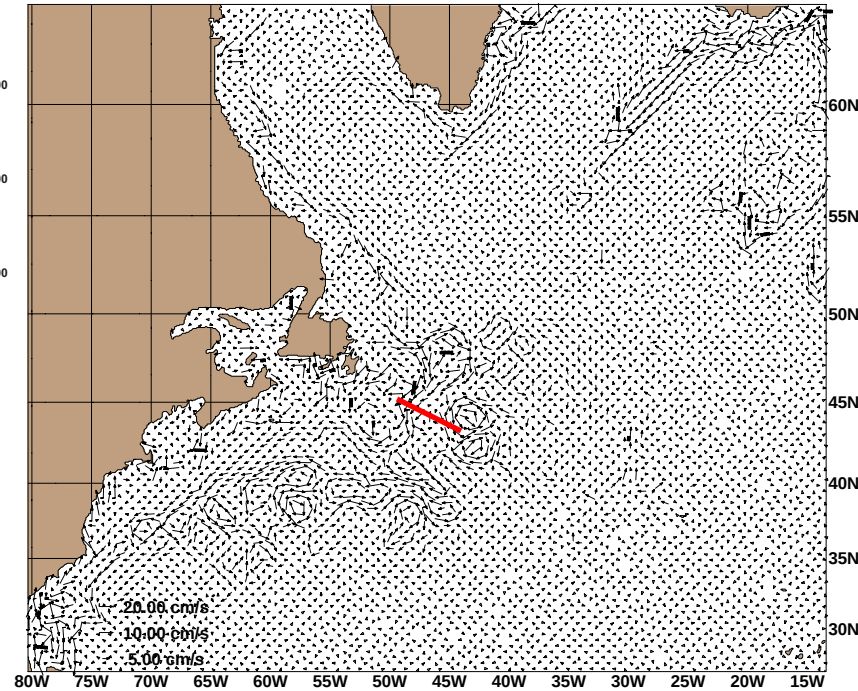


43°N, nowcast

v-velocity zonal sec. 43.03n mean: 2003.67- 2004.67 [09.1H]

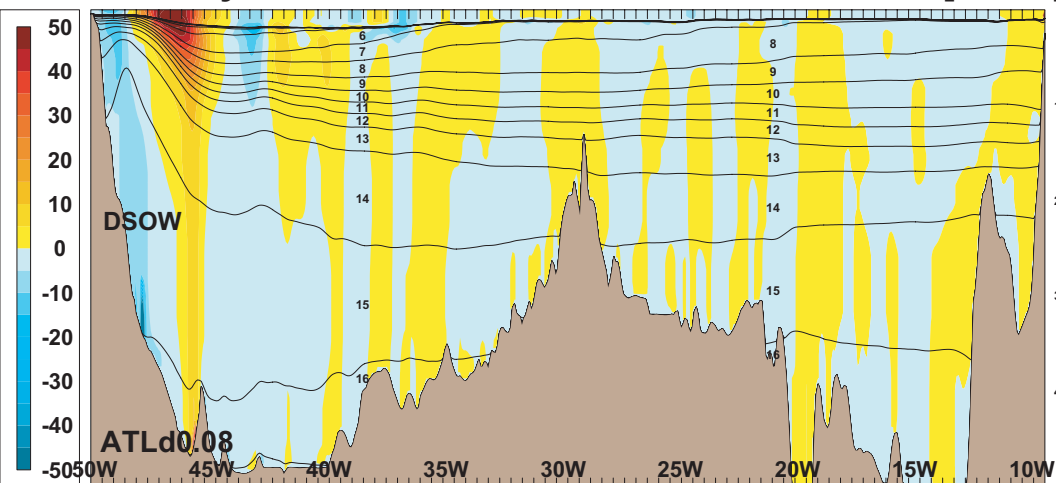


layer=21 velocity mean: 2003.67-2004.67 [09.1H]

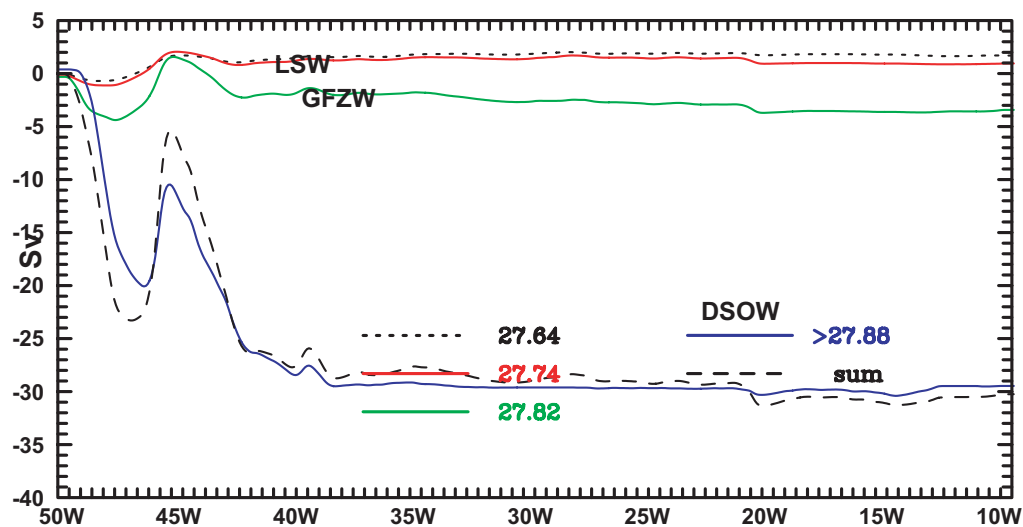
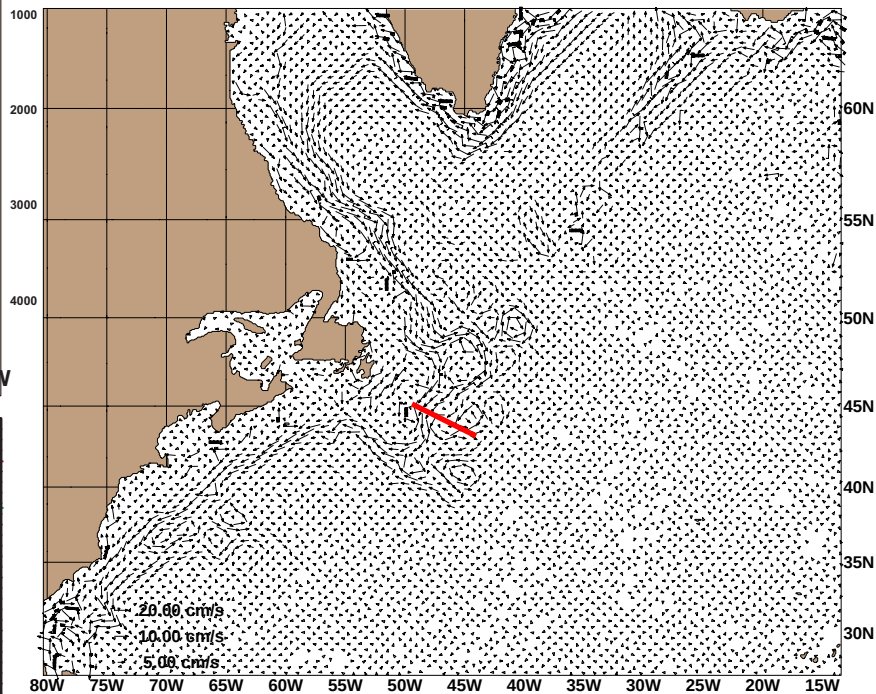


43°N, MICOM

v-velocity zonal sec. 43.03n mean: 80.00- 81.00 [01.0H]



layer=15 velocity mean: 1981.00-1982.00 [01.0H]



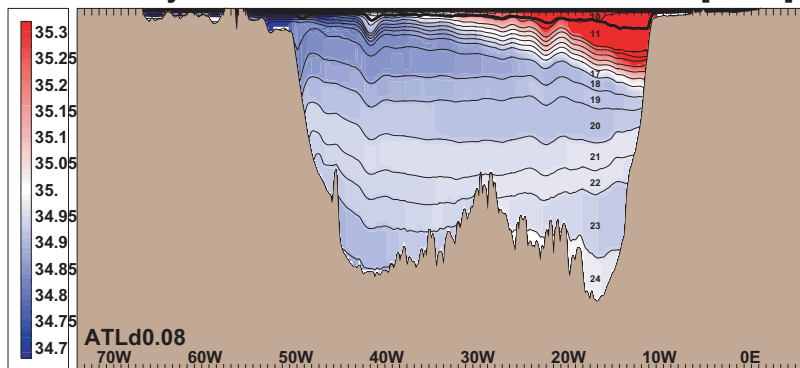
43°N, western boundary and Atlantic

WEST					ATL		
	Obs	Sig	Now	MIC	Sig	Now	MIC
uLSW	-.7	-2.0	-.6	-.7	-4	+2	+2
LSW	-3.3	-.4	-3.4	-.9	-4	-2	+1
GFZW	-4.3	-.7	-4.8	-3.7	-4	-10	-3
DSOW	-4.6	-3.7	-9.7	-20.5	-4	-16	-30
Below uLSW	-12.2	-5	-18	-25	-12	-28	-32
uLSW+below	-13	-7	-18.5	-26	-16	-26	-30

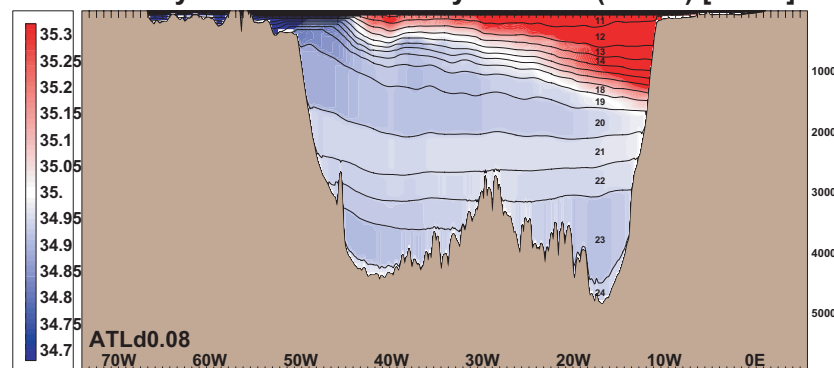
LSW lay 19,20

Sig2* and GDEM3 40° to 50°N

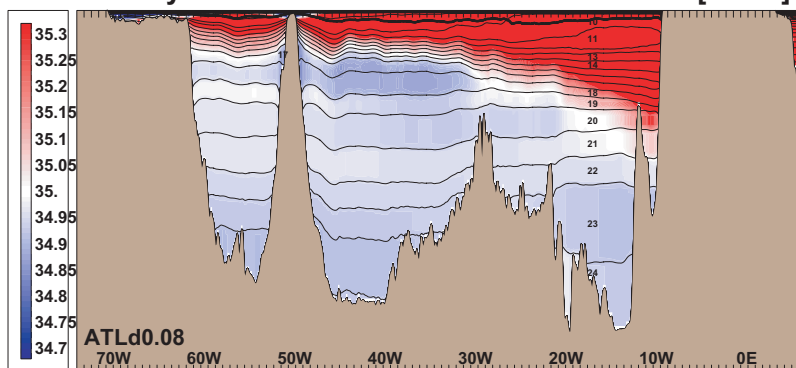
salinity zonal sec. 49.96n mean: 7.00- 8.00 [11.4H]



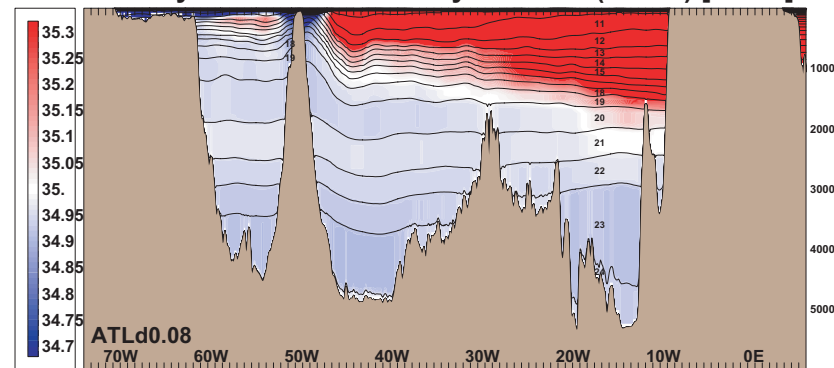
salinity zonal sec. 49.96n year 0.54 (Jul 17) [11.0H]



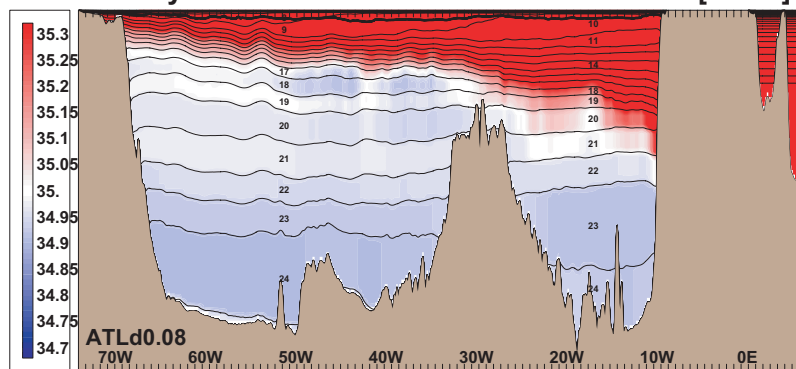
salinity zonal sec. 42.97n mean: 7.00- 8.00 [11.4H]



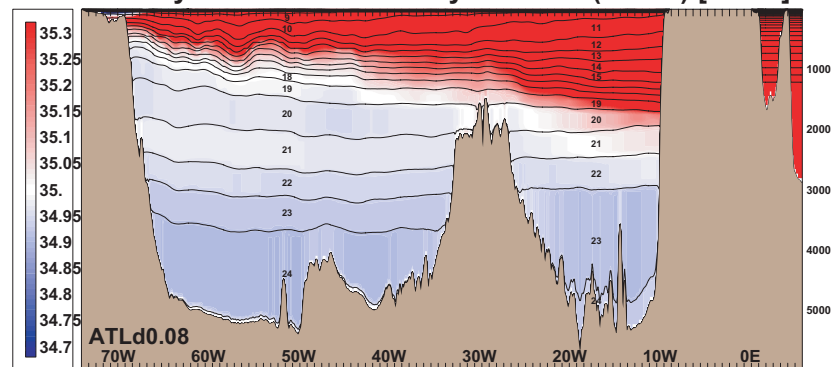
salinity zonal sec. 42.97n year 0.54 (Jul 17) [11.0H]



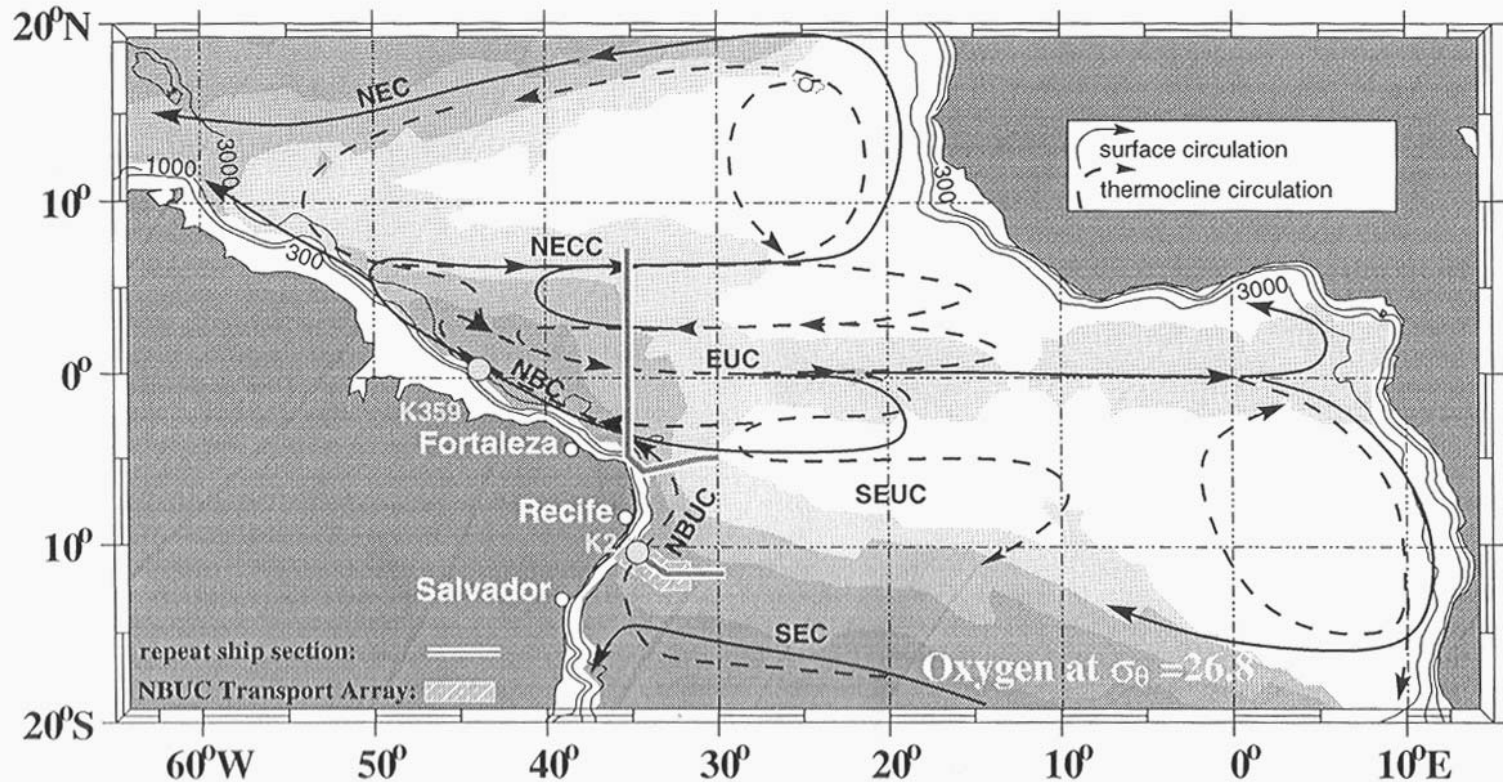
salinity zonal sec. 40.04n mean: 7.00- 8.00 [11.4H]



salinity zonal sec. 40.04n year 0.54 (Jul 17) [11.0H]



Equatorial and tropical observations (Schott et al., 2002, 2003)



35°W, 23°W

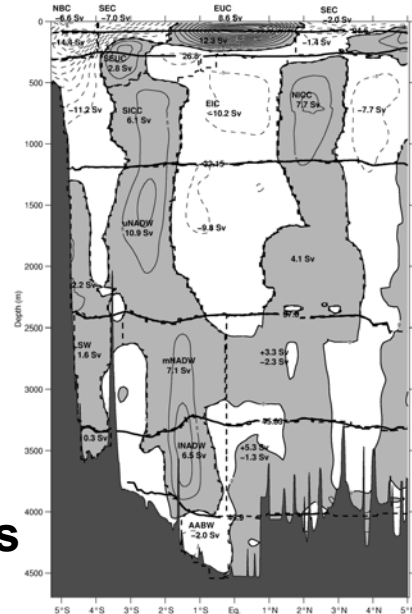
5°S

11°S

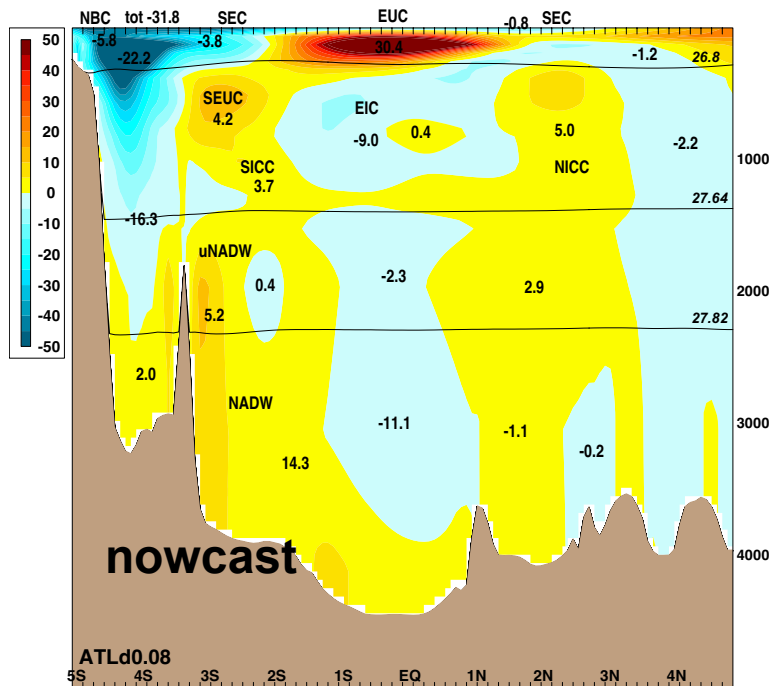
NBC 21 EUC 21

35°W eq

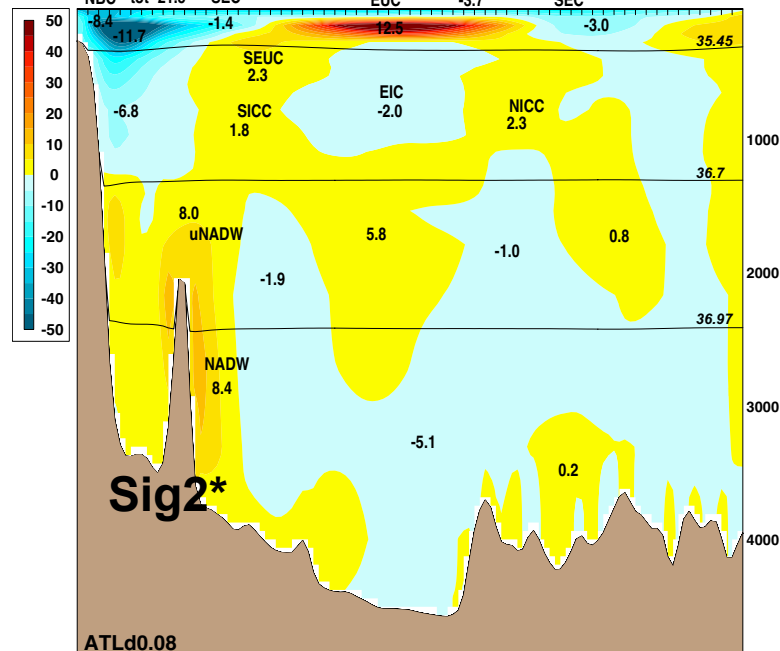
obs



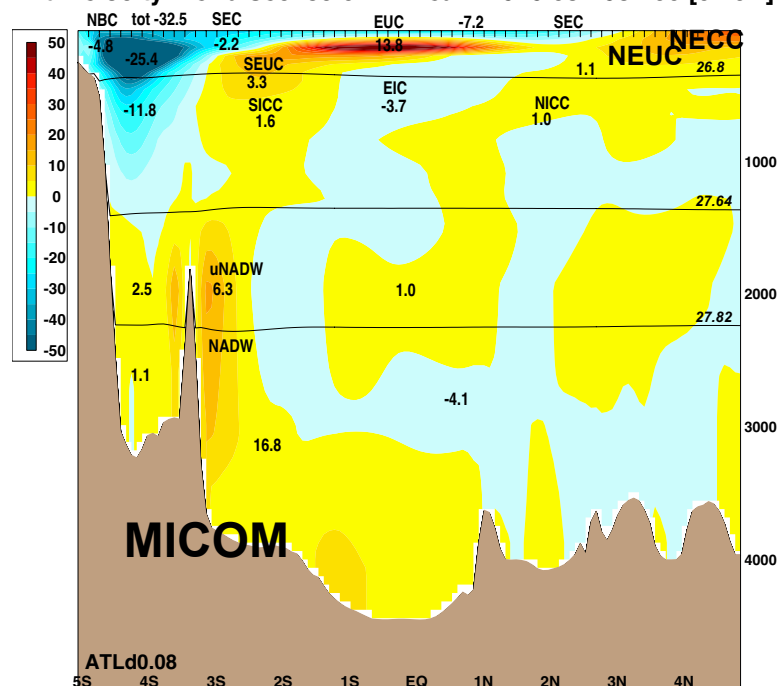
u-velocity merid.sec. 35.04w mean: 2003.67-2004.67 [09.1H]



u-velocity merid.sec. 35.04w mean: 7.00- 8.00 [11.4H]



u-velocity merid.sec. 35.04w mean: 1979.08-1982.00 [01.0H]



35°W equatorial section

	Obs	Sig2*	Nowcast	MICOM
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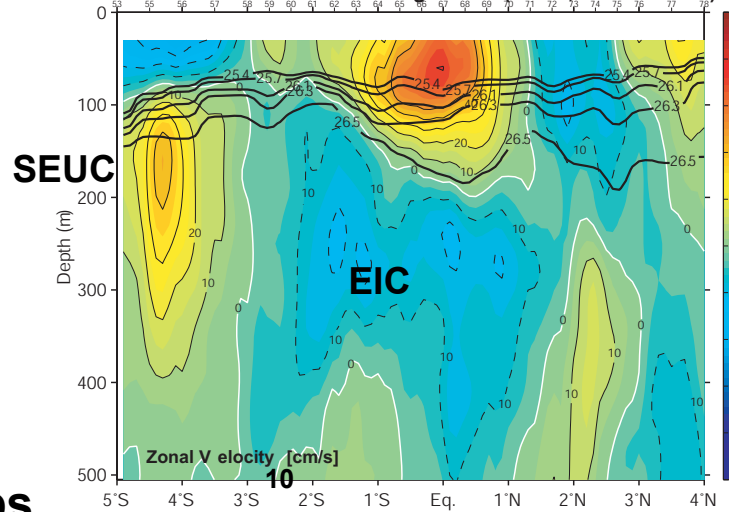
NBC	21	20	28	30
NBUC	11	7	16	12
EUC	21	12.5	30	14
SECw	7	1.4	4	2.2
SEUC	2.8	2.3	4.2	2.2
SICC	6.1	1.8	3.7	1.6
NICC	7.7	2.3	5.0	1.0
umiNADW	24.5	16.0	21.0	26.7
Tot up	23.3	16.0	12.9	26.7
Tot low	25.9	11.5	7.5	24.2

23°W equatorial section

(red > 50cm/s)

EUC

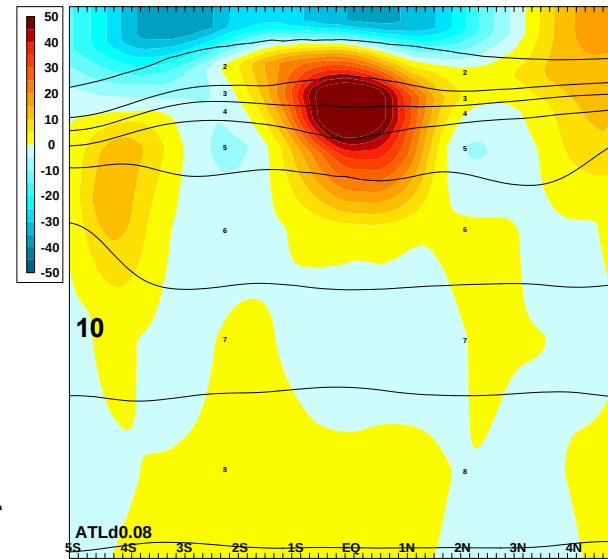
VMADCP V velocities along 23°W (M47/1, March 2000)



obs

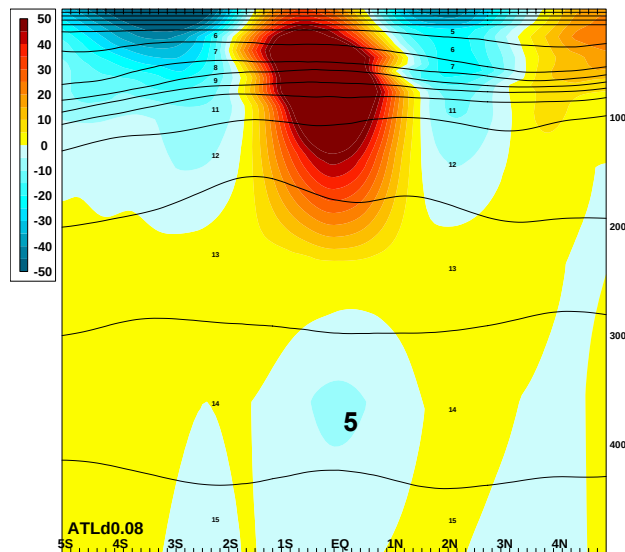
(brown > 50cm/s)

u-velocity merid.sec. 23.04w mean: 1981.00-1982.00 [01.



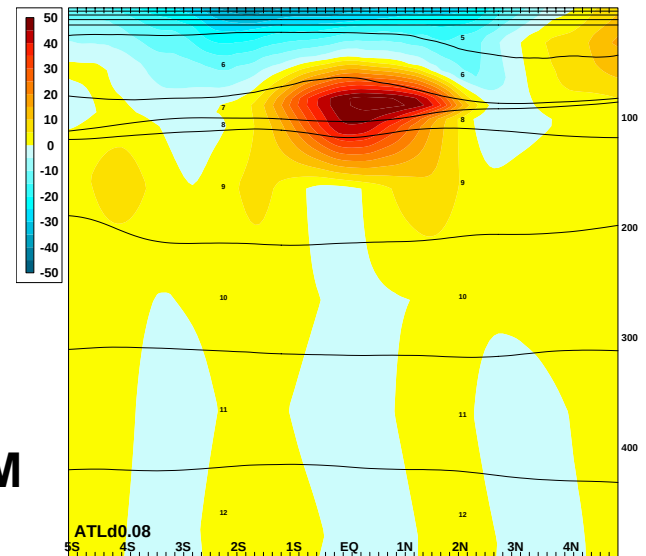
Sig2*

u-velocity merid.sec. 23.04w mean: 2003.67-2004.67 [09.1H]



nowcast

u-velocity merid.sec. 23.04w mean: 7.00- 8.00 [11.4H]



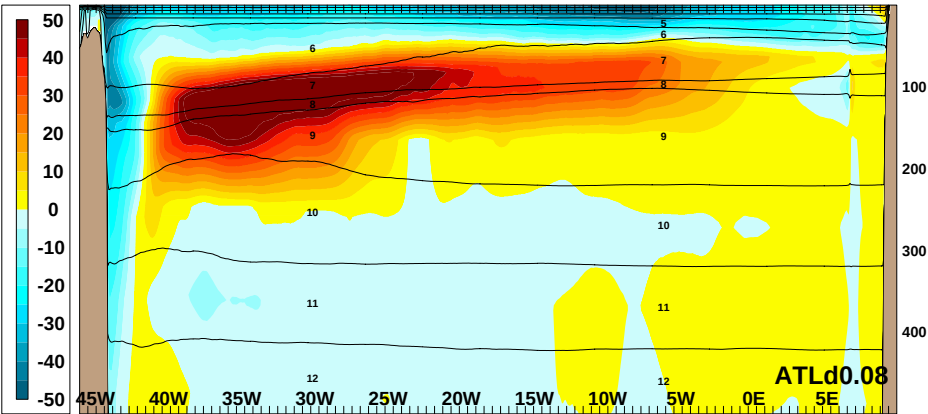
MICOM

Zonal velocity at equator

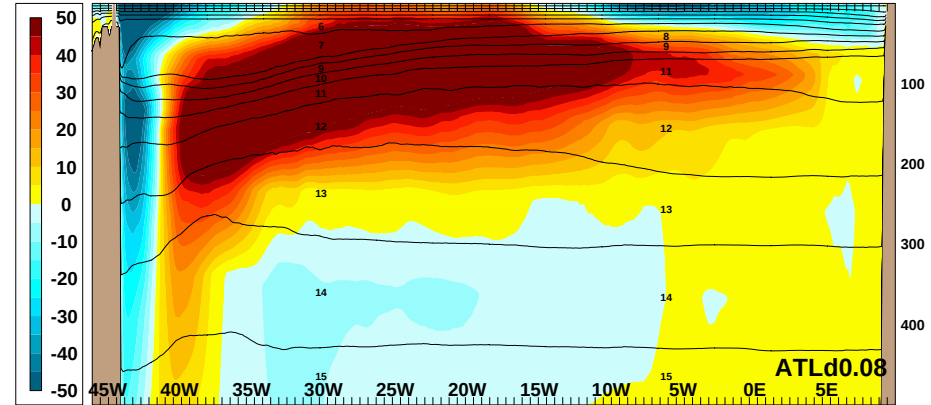
nowcast

Sig2*

u-velocity zonal sec. 0.00s mean: 7.00- 8.00 [11.4H]

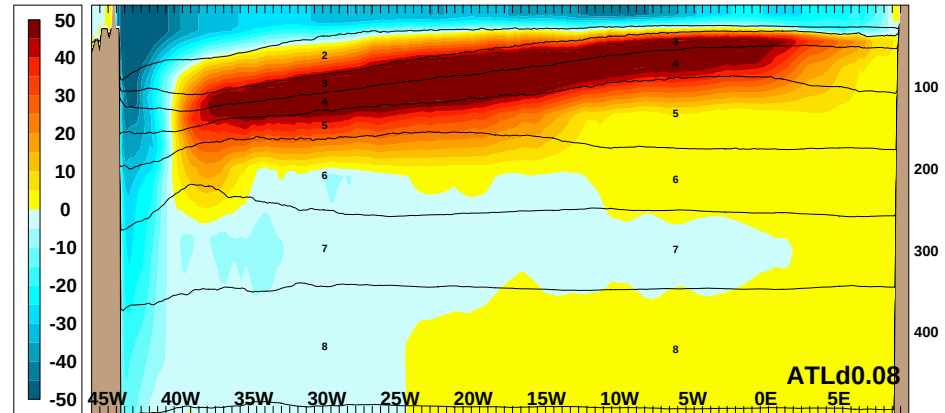


u-velocity zonal sec. 0.00s mean: 2003.67-2004.67 [09.1H]



MICOM

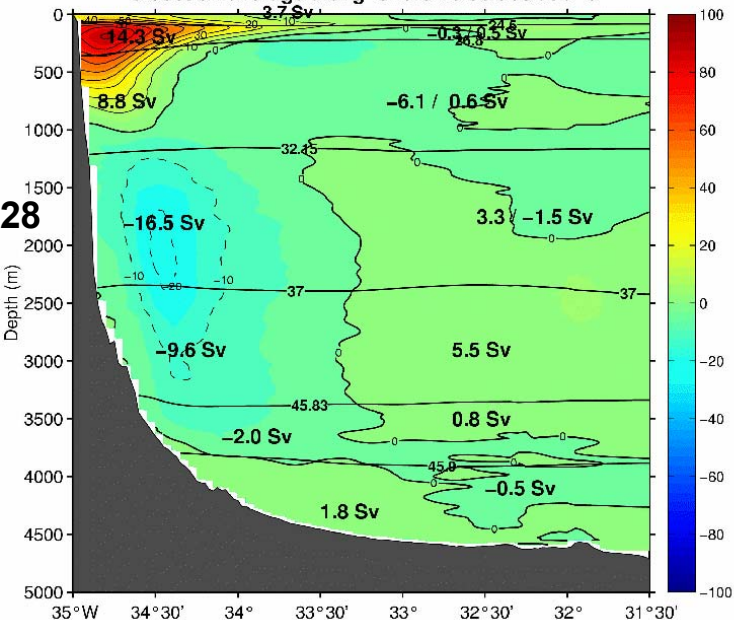
u-velocity zonal sec. 0.00s mean: 1981.00-1982.00 [01.0H]



Mean ADCP/LADCP section at 5S

27

8 Section average along-shore velocities at 5°S



NBUC=26.8Sv
14.3 in EUC layer

Offshore southward
AAIW level flow

Net upper=21.5 Sv

DWBC= -28.1 Sv

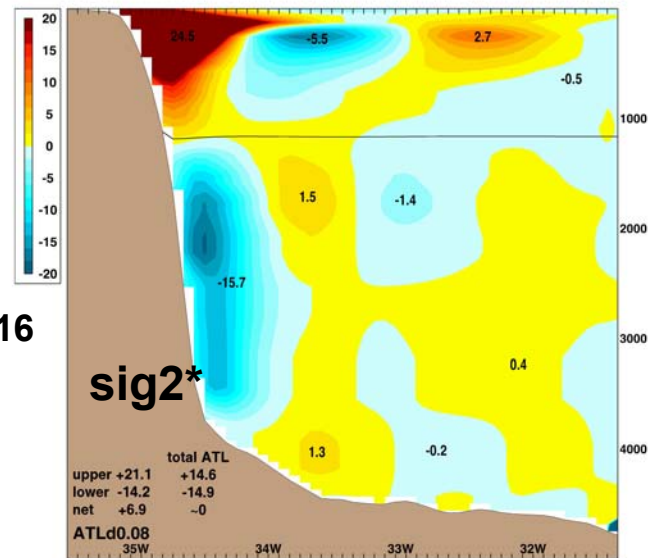
Net deep: -20.0 Sv

AABW: 1.3 Sv

5°S

v-velocity zonal sec. 5.11s mean: 7.00- 8.00 [11.4H]

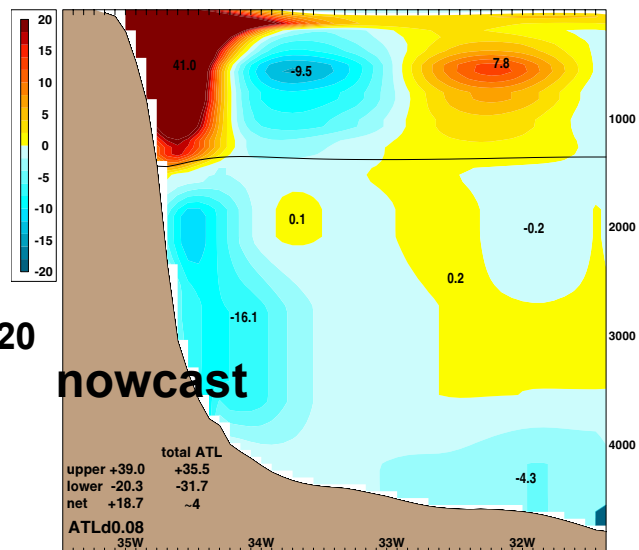
16



Deep east: -.7

41

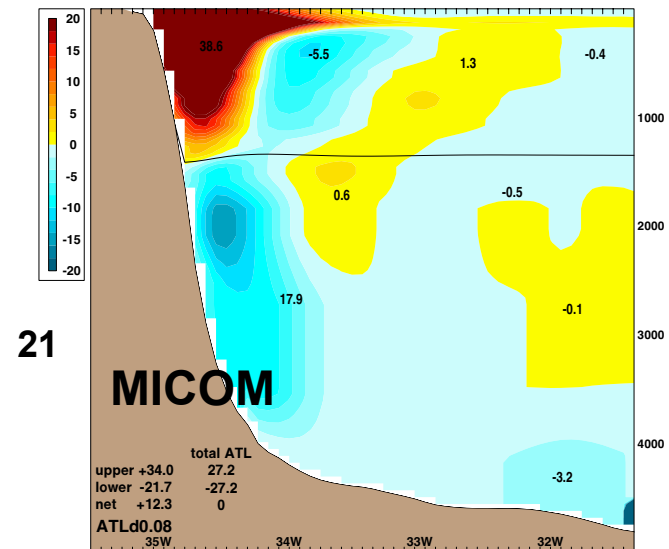
v-velocity zonal sec. 5.11s mean: 2003.67-2004.67 [09.1H]



Deep east: -11

39

v-velocity zonal sec. 5.19s mean: 1981.00-1982.00 [01.0H]

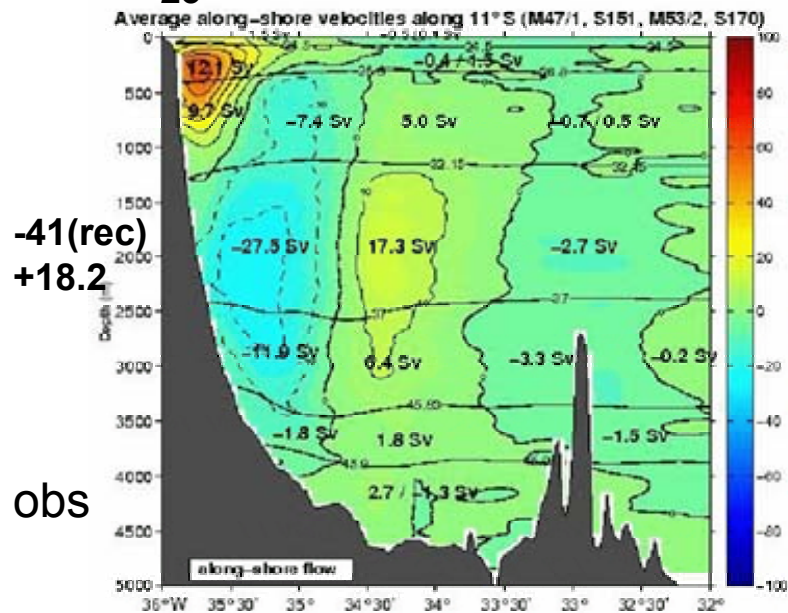


Deep east: -6

Mean ADCP/LADCP section at 11S

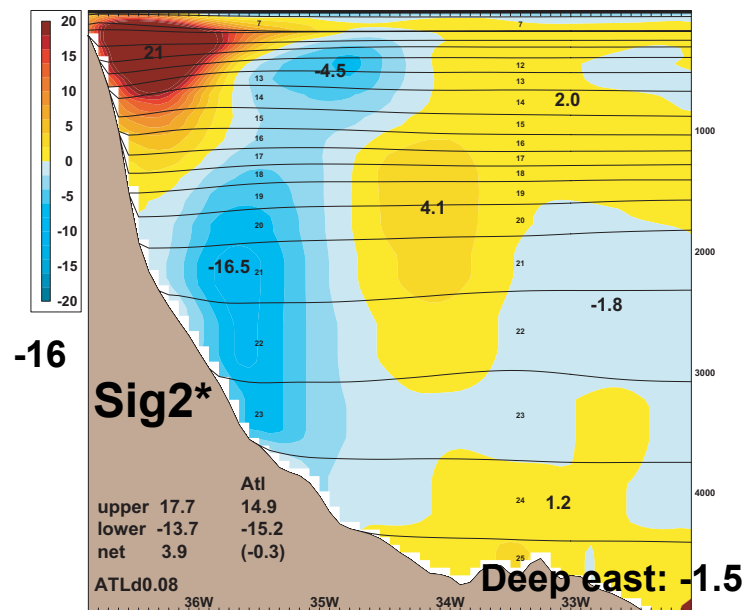
11°S

23



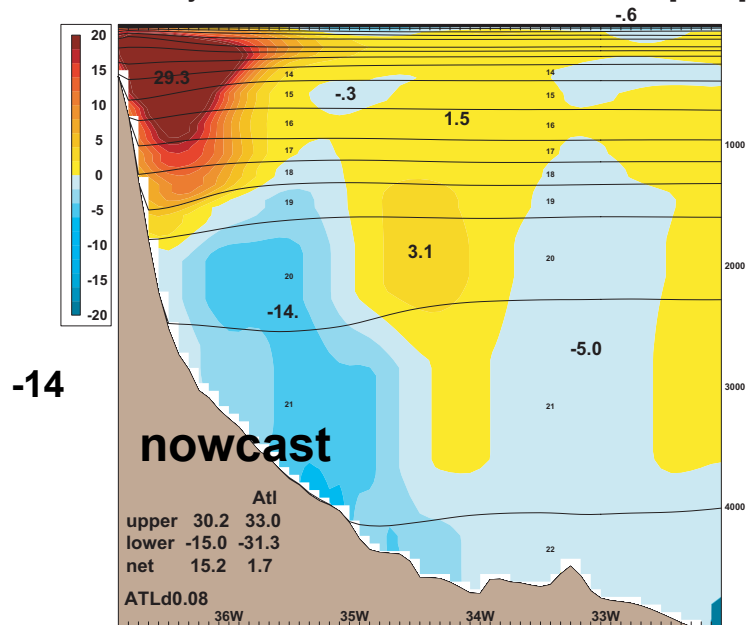
NBUC=23.3 Sv
12.1 Sv in EUC layer
southward offshore
flow at AAIW level
Net north. 19.2 Sv
DWBC=41.2 Sv
but 18.2 Sv northw.
Offshore
Net southw. -23.0 Sv
AABW: 1.4 Sv
 Section also nearly
 closed (10%), despite
 aliasing

21 v-velocity zonal sec. 11.13s mean: 7.00- 8.00 [11.4H]



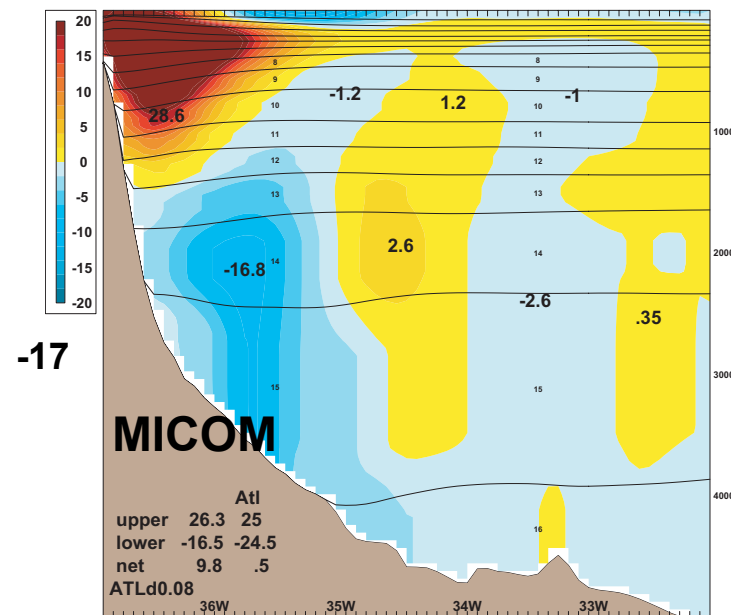
29

v-velocity zonal sec. 11.13s mean: 2003.67-2004.67 [09.1H]



Deep east: -16

29 v-velocity zonal sec. 11.13s mean: 1981.00-1982.00 [01.0H]



Deep east: -8

5°S

	Observ	Sig2a	Nowcast	micom
NBUC	27	24	41	38
dWBC	-28	-16	-20	-21
net up/deep	21.5/-20	21/-14	39/-20	34/-22

11°S

	Observ	Sig2a	Nowcast	micom
NBUC	23	21	29	29
dWBC	41.2(rec)	-16	-14	-17
net Up/deep	19/-22	18/-14	30/-15	26/-16

Whole Atlantic
5°S

	Sig2a	Nowcast	micom
Upper	14.6	35.5	27.2
Upper Atl-W	-10	-5	-11
Deep east	-1	-11	-6
Net	~0	~4	0

11°S

	Sig2a	Nowcast	micom
Upper	15	33	25
Upper Atl-W	-6	+4	-4
Deep east	-1	-16	-8
Net	~0	~2	.5