

BOUSSOLE Monthly Cruise Report

Cruise 55

July 7 - 9, 2006

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Vessel: R/V Téthys II

(Captain: Alain Stéphan)

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Fig 1. A whale seen close to the buoy.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

July 13, 2006



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Cruise Objectives

Multiple SPMR profiles are to occur within 1 hour of satellite overhead passes of MERIS around solar noon, under optimal conditions: clear blue skies and flat, calm sea surface. If the sky is clear and sea conditions are reasonably calm (no whitecaps or large swell), hand held CIMEL sun photometer measurements are to be performed consecutively where possible with SPMR profiles. If sea conditions are poor but sky is good, hand held CIMEL sun photometer measurements can be made at intervals throughout the day to measure atmospheric optical thickness. A floating platform is to be used to support the SPMR Eu sensor approximately 20cm below the surface for up to 3 minutes of stable light field before a release mechanism triggers the release of the profiler to start a descent as normal. Multiple descents ideally will be started in this way and the data will be used to assess near-surface Eu extrapolation model calculations. CTD deployments are required at the start and end of the SPMR profiling day and around noon in the longer summer days or when there is a high possibility of a satellite matchup. In addition to the depth profile from the CTD, CDOM fluorometer, Chl fluorometer and AC9, seawater samples are to be collected, filtered and stored in N₂ for HPLC pigment and particule absorption spectrophotometric filter analysis in the lab. A gimble PAR sensor positioned on the foredeck and operated from the CTD computer serves as a light field stability indicator during SPMR profiling.

For one day of each cruise, at the end of the optics measurements on site, there will be one ctd transect between the Boussole site and the Port of Nice. This transect consists of four fixed locations on-route from Boussole and a final two station positions to be decided during the transect in order to sample on both sides of the main frontal structure between the coastal waters and Ligurian Sea. The time of day of this transect should be similar for each cruise, if possible to minimise influence of diurnal variability.

Cruise Summary

Weather conditions were very good, while the forecasts were not so good (West winds in the “Bouches-du-Rhône” should have brought some swell). The first day, the sea was a little bit choppy. The sky was deep blue until middle of last day where some Cumulus and Alto Stratus covered 5/8 of the sky. Otherwise the cruise was very efficient with good matchups between SPMR/SMSR and MERIS and very good conditions for all measurements.

CIMEL hand held sun photometer was repaired and performed 8 atmospheric total optical thickness measurements.

Friday 07 July 2006

First operation of the day was the buoy data uploading, which was realized without troubles. Then, divers went at sea, as the weather forecast was uncertain. They tried the new BOUSSOLE digital camera and its hermetic box, and cleaned the sensors, even if it was not very necessary because the buoy and instruments were still clean after only one month of deployment. Others operations were 2 CTD casts, 1 Secchi disk measurement, 1 CIMEL measurement and 1 SPMR profile. The SPMR profiling series was interrupted due to heterogeneous clouds.

Saturday 08 July 2006

When climbing on the buoy head to clean ARGOS beacon electric contact, it has been seen that during some sand episodes from early July the MVD sensors were dirty (as well as all the buoy structure above the water line) and needed to be cleaned up.

12 SPMR/SMSR profiles were realized this day, as well as 2 CTD casts, 5 CIMEL measurements and 3 Secchi disk measurements. Water was sampled with the rosette at 5 meters for dry weights operation.

The ship still stayed on site for the night.

Sunday 09 July 2006

6 SPMR/SMSR profiles were performed, as well as 1 Secchi disk measurement, 2 CIMEL measurements (after while sky was covered) and 7 CTD casts (among which 6 on transect). The rosette was used to sample sea water at 5 m depth for dry weights.

Cruise Report

07 July 2006 (UTC)

- 0420 Departure from port of Nice.
- 0815 Buoy data retrieval.
- 1005 CTD 01 (buoy, 400 m) with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters for HPLC and Ap.
- 1043 CIMEL 01.
- 1050 3 x 100 meters plankton net.
- 1100 Secchi disk 01 (19 m) close to the buoy.
- 1144 SPMR profile 1.
- 1203 CTD 02 (buoy, 400 m) with water sampling at 10 and 5 meters for triplicate HPLC/Ap and for dry weights.

08 July 2006

- 0628 SPMR profiles 2, 3, 4 and 5.
- 0655 Secchi disk 02 (24 m) close to the buoy.
- 0725 CIMEL 02.
- 0732 CTD 03 (buoy, 400 m) with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters for HPLC/Ap.
- 0821 SPMR profiles 6, 7 and 8 with floating structure.
- 0846 CIMEL 04.
- 0920 Secchi disk 03 (25 m) close to the buoy.
- 1125 CIMEL 05.
- 1137 CTD 04 (400 m, buoy) with water sampling at 10 and 5 meters for HPLC/Ap.
- 1300 Guislain BECU on buoy head to clean ARGOS beacon contact and also the MVD sensor after sand coming from North Africa.
- 1330 water sampling with rosette at 5 meters for dry weights.
- 1412 CIMEL 06.
- 1420 SPMR 9, 10, 11, 12 and 13 with floating structure.
- 1519 CIMEL 07.
- 1615 buoy data retrieval.

09 July 2006

- 0605 CTD 05 (buoy, 400 m) with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters for HPLC and Ap.
- 0641 CIMEL 08.
- 0658 SPMR profiles 14, 15, 16, 17 and 18.
- 0728 CIMEL 09.
- 0800 Secchi disk 04 (25 m) close to the buoy.
- 0805 water sampling with rosette at 5 meters for dry weights operation.
- 0840 CTD 06 at station 1 (43°25'N 07°48'E).
- 0944 CTD 07 at station 2 (43°28'N 07°42'E).
- 1046 CTD 08 at station 3 (43°31'N 07°37'E).
- 1149 CTD 09 at station 4 (43°34'N 07°31'E).
- 1255 CTD 10 at station 5 (43°37'N 07°25'E).
- 1347 CTD 11 at station 6 (43°39'N 07°21'E).
- 1425 Arrival at port of Nice.

Calculated Swath paths for MERIS Sensor (ESOV Software)

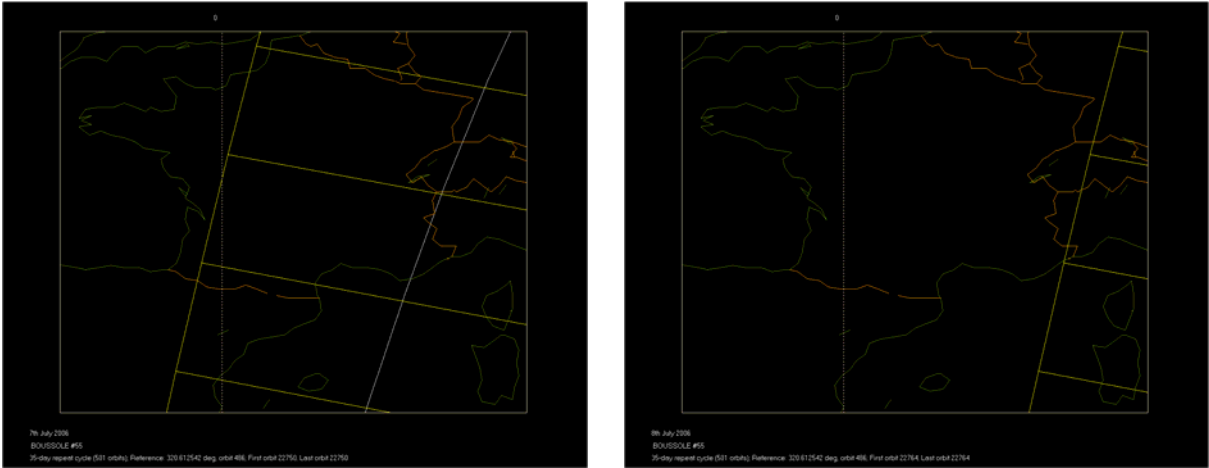
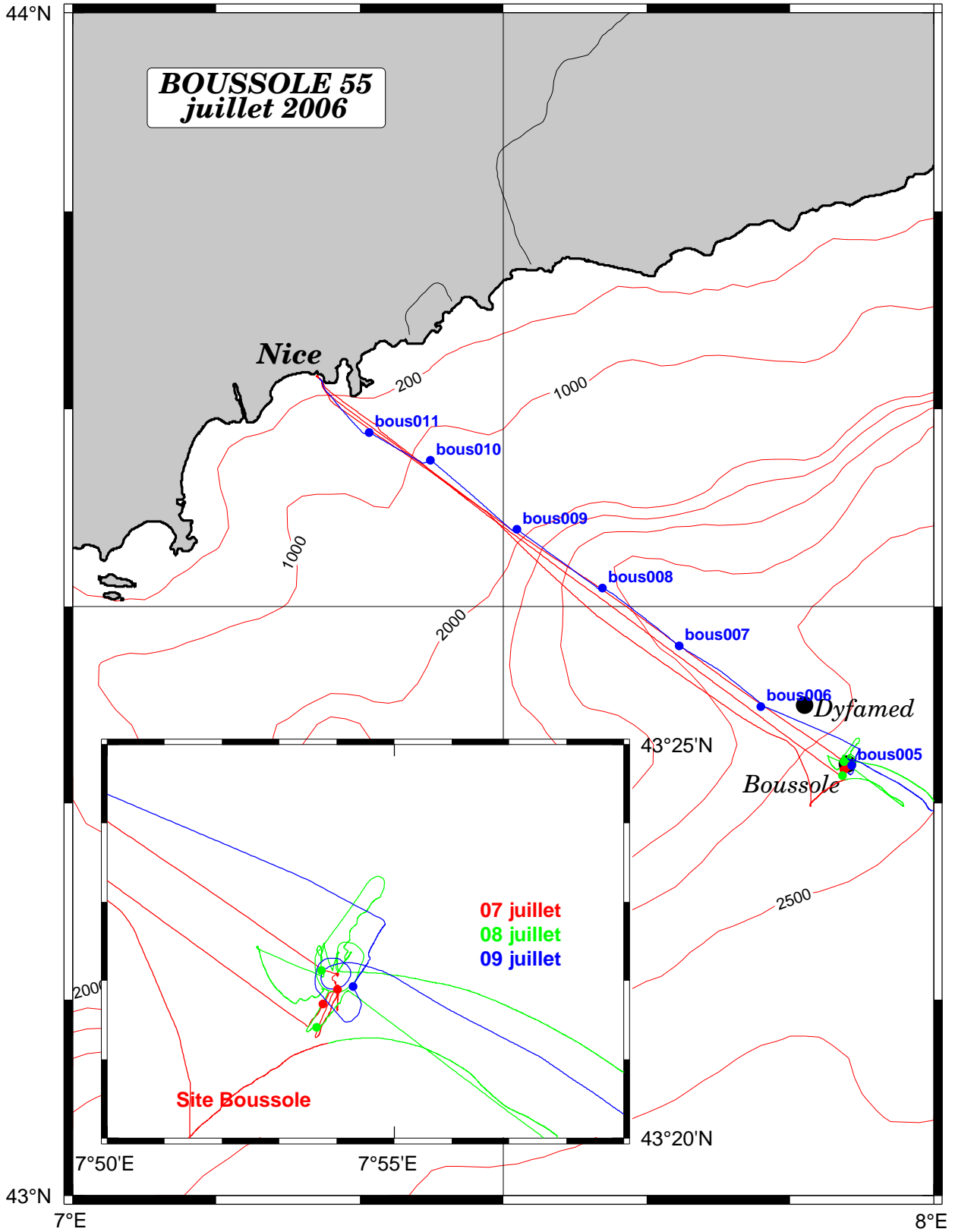


Figure 2. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for 07 and 08 July 2006.

Appendix

Cruise Summary Table for Bousole 55

Date	Black names (file ext. ".raw")	Profile names (file extension: ".raw")	CTD nozzles / satellite overpass	Start time GMT (hour:min)	Duration (min:sec)	Depth max (meter)	Latitude (N) (Degree)	Longitude (Degree)	Other sensors	Starboard/Finish	Sky	Clouds	Quantity (#/8)	Weather	Wind speed	Wind dir.	Atm. Pressure	humidity	Visibility	T Air	T water	Sea	Sea Swell height	Whitcaps	
07/07/2006				10:05	31:00	400	43	21.882	54.009		some clouds	heter.	3	9 kn	108	1016.3	69	very good	23.8	24.0	choppy	0.9 m	some		
			CTDBOUS001	10:05	21:00	205	43	21.882	54.009		blue	far Ci	2	5 kn	108	1016.3	75	very good	23.8	24.0	choppy	0.9 m	some		
				11:03	02:00	19	43	22.000	54.000	Secchi disk 1	blue	far Ci	2	5 kn	108	1016.3	75	very good	23.8	24.0	choppy	0.9 m	some		
				11:44	02:22	45	43	22.000	54.000	Secchi disk 2	covered	covered	7	8 kn	114	1016.0	73	very good	23.6	24.1	choppy	0.7 m	yes		
			CTDBOUS002	12:03	31:00	400	43	21.705	53.760		covered	heter.	4	8 kn	104	1016.1	74	very good	23.4	24.1	calm	0.5 m	some		
				06:14	03:00																				
				06:28	04:49	205	43	21.786	54.086		blue	far Ci	1	5 kn	276	1015.9	75	excellent	24.6	24.6	choppy	0.1 m	no		
				06:41	04:22	205	43	21.709	54.031		blue	far Ci	1	5 kn	276	1015.9	75	excellent	24.6	24.6	choppy	0.1 m	no		
				06:53	06:07	205	43	21.653	53.952		blue	far Ci	1	5 kn	276	1015.9	75	excellent	24.6	24.6	choppy	0.1 m	no		
				07:42	06:15	205	43	21.508	53.813		blue	far Ci	1	5 kn	276	1015.9	75	excellent	24.6	24.6	choppy	0.1 m	no		
08/07/2006				06:55	02:00	24	43	22.000	54.000	Secchi disk 2	blue	far Ci	1	3 kn	337	1016.3	77	excellent	24.5	24.0	choppy	0.1 m	no		
				07:57	02:00	400	43	21.407	53.649	CIMEL 02	blue	far Ci	1	3 kn	337	1016.3	77	excellent	24.5	24.0	choppy	0.1 m	no		
			CTDBOUS003	07:57	02:00	400	43	22.000	54.000	CIMEL 03	blue	far Ci	1	3 kn	337	1016.3	77	excellent	24.5	24.0	choppy	0.1 m	no		
				08:07	05:00						blue	far Ci	1	3 kn	337	1016.3	77	excellent	24.5	24.0	choppy	0.1 m	no		
				08:21	06:42	205	43	21.833	53.715		blue	far Ci	1	2 kn	278	1016.5	74	excellent	25.1	25.1	choppy	0.1 m	no		
				08:38	06:47	205	43	21.795	53.538		blue	far Ci	1	2 kn	278	1016.5	74	excellent	25.1	25.1	choppy	0.1 m	no		
				08:55	06:57	219	43	21.719	53.298		blue	far Ci	1	2 kn	278	1016.5	74	excellent	25.1	25.1	choppy	0.1 m	no		
				09:10	03:00						blue	far Ci	1	2 kn	278	1016.5	74	excellent	25.1	25.1	choppy	0.1 m	no		
				09:20	02:00	25	43	22.000	54.000	CIMEL 04	blue	far Ci	1	2 kn	278	1016.6									
				09:30	02:00	400	43	22.133	53.738	CIMEL 05	blue	far Ci	1	2 kn	278	1016.6									
09/07/2006				11:37	31:00	5	43	22.000	54.000	dry weights	blue	far Ci	2	2 kn	183	1016.7	67	excellent	25.8	24.2	choppy	0.1 m	no		
				13:30	05:00	400	43	22.000	54.000	CIMEL 06	blue	far Ci	1	2 kn	183	1016.7	67	excellent	25.8	24.2	choppy	0.1 m	no		
				14:12	02:00	400	43	22.000	54.000		blue	far Ci	1	2 kn	183	1016.7	67	excellent	25.8	24.2	choppy	0.1 m	no		
				14:12	03:00	206	43	22.280	54.143		blue	far Ci	1	3 kn	235	1016.8									
				14:18	07:08	206	43	22.280	54.143		blue	far Ci	1	3 kn	235	1016.8									
				14:35	07:12	206	43	22.410	54.138		blue	far Ci	1	3 kn	235	1016.8									
				14:52	06:53	205	43	22.553	54.228		blue	far Ci	1	3 kn	235	1016.8									
				15:09	06:50	207	43	22.756	54.354		blue	far Ci	1	3 kn	235	1016.8									
				15:46	05:06	210	43	22.924	54.356		blue	far Ci	1	3 kn	235	1016.8									
				15:46	05:00	400	43	22.000	54.000	CIMEL 07	blue	far Ci	1	1 kn	167	1016.8									
09/07/2006				06:05	33:00	400	43	21.930	54.287		blue	slight fog	2	1 kn	167	1018.6	84	very good	24.7	24.2	calm	0.2 m	no		
			CTDBOUS005	06:41	02:00	400	43	22.000	54.000	CIMEL 08	blue	slight fog	2	1 kn	167	1018.6	84	very good	24.7	24.2	calm	0.2 m	no		
				06:39	03:00						blue	slight fog	2	1 kn	167	1018.6	84	very good	24.7	24.2	calm	0.2 m	no		
				06:58	04:41	205	43	22.286	54.578		blue, slight milky	far Ci	2	3 kn	73	1018.9	82	excellent	25.4	25.4	calm	0.2 m	no		
				07:09	04:29	205	43	22.370	54.565		blue, slight milky	far Ci	2	3 kn	73	1018.9	82	excellent	25.4	25.4	calm	0.2 m	no		
				07:19	04:44	220	43	22.440	54.672		blue, slight milky	far Ci	2	3 kn	73	1018.9	82	excellent	25.4	25.4	calm	0.2 m	no		
				07:31	04:38	210	43	22.516	54.670		blue, slight milky	far Ci	2	3 kn	73	1018.9	82	excellent	25.4	25.4	calm	0.2 m	no		
				07:49	04:36	210	43	22.597	54.726		blue, slight milky	far Ci	2	3 kn	73	1018.9	82	excellent	25.4	25.4	calm	0.2 m	no		
				07:59	04:30	210	43	22.597	54.726		blue, slight milky	far Ci	2	3 kn	73	1018.9	82	excellent	25.4	25.4	calm	0.2 m	no		
				07:28	02:00	400	43	22.000	54.000	CIMEL 09	blue, slight milky	slight fog	3	3 kn	143	1018.5									
09/07/2006				08:00	02:00	25	43	22.595	54.702	Secchi disk 3	blue, slight milky	slight fog	3	3 kn	143	1018.5									
				08:02	05:00	5	43	22.000	54.000		blue, slight milky	slight fog	3	3 kn	143	1018.5									
				08:40	27:00	400	43	24.932	47.950		covered	heter.	7	3 kn	143	1019.0	83	very good	25.4	24.2	calm	0.2 m	no		
				09:44	24:00	400	43	27.996	42.267		covered	stratus / Ci	6	4 kn	165	1019.3	79	very good	25.9	24.5	calm	0.2 m	no		
				10:46	29:00	400	43	30.929	36.925		covered	stratus / Ci	6	5 kn	173	1019.3	83	very good	24.9	24.9	calm	0.2 m	no		
				11:49	27:00	400	43	33.910	30.947		covered	stratus / Ci	6	4 kn	168	1019.3	85	very good	25.0	24.6	calm	0.2 m	no		
				12:55	27:00	400	43	37.405	24.938		covered	stratus / Ci	7	2 kn	141	1019.3	80	very good	26.1	24.6	calm	0.2 m	no		
				13:47	26:00	400	43	38.620	20.661		covered	stratus / Ci	8	4 kn	87	1019.3	80	very good	26.2	25.0	calm	0.2 m	no		

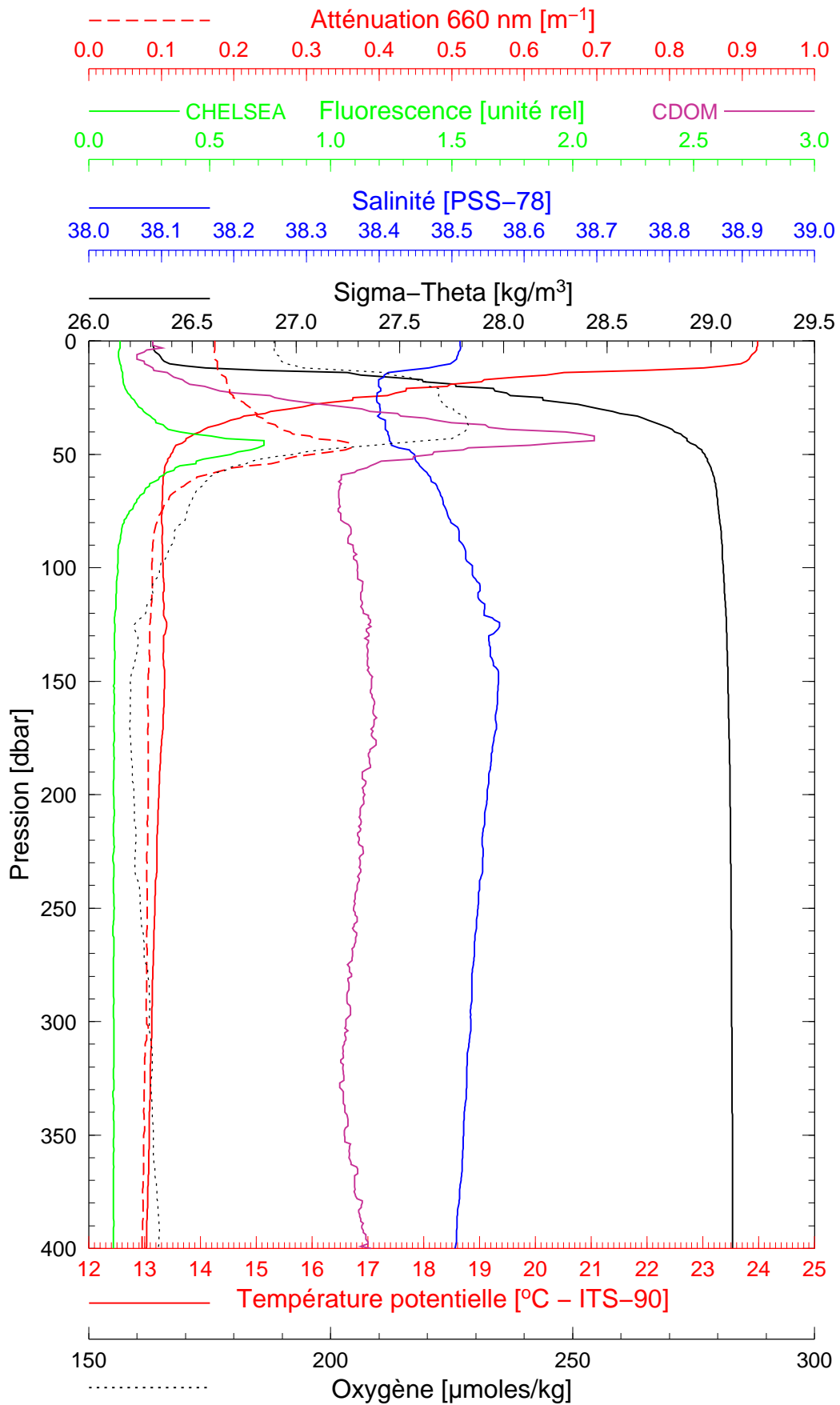


Boussole 55

07/07/2006

BOUS060707_01

BOUS001



Date 07/07/2006
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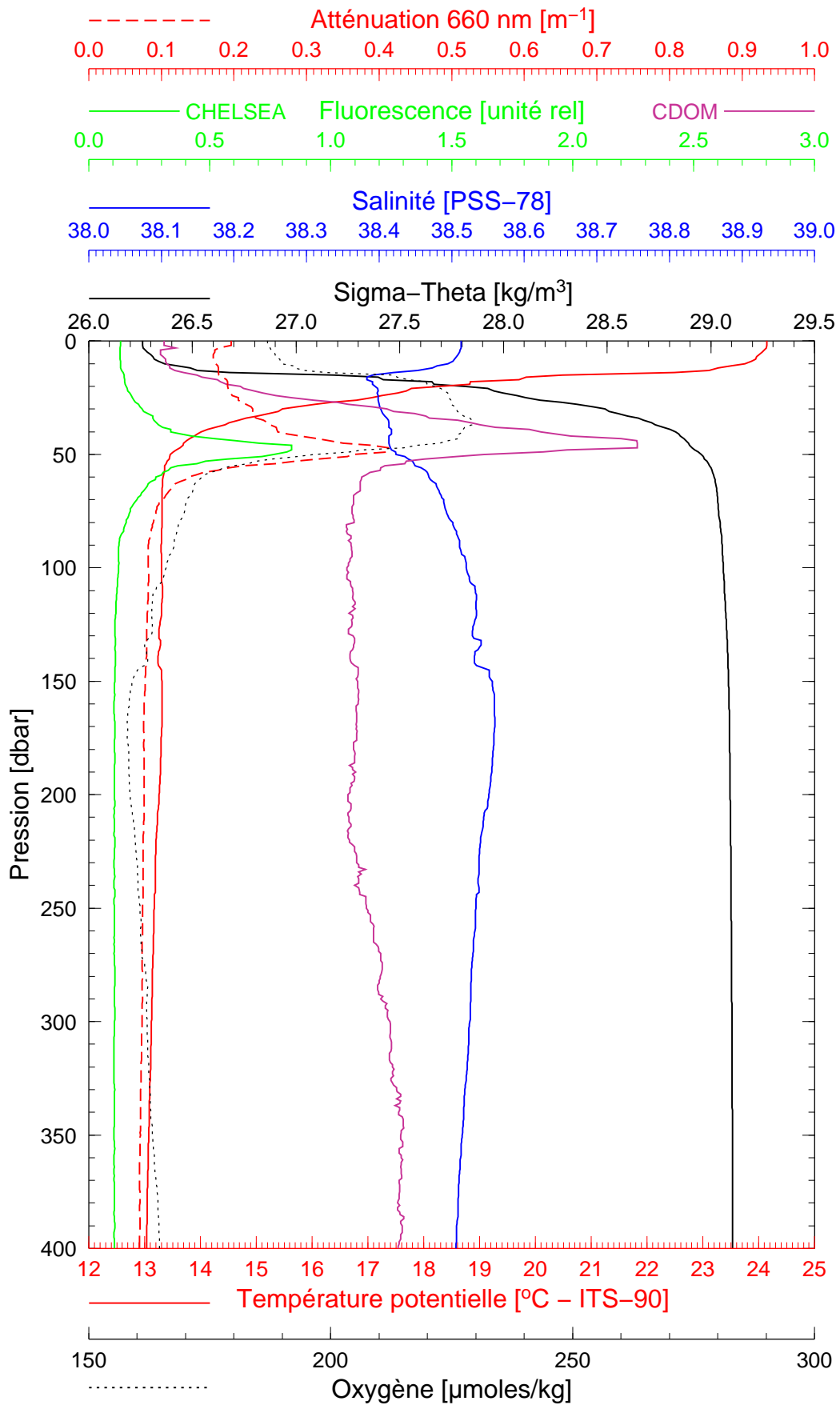
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Boussole 55

07/07/2006

BOUS060707_02

BOUS002



Date 07/07/2006
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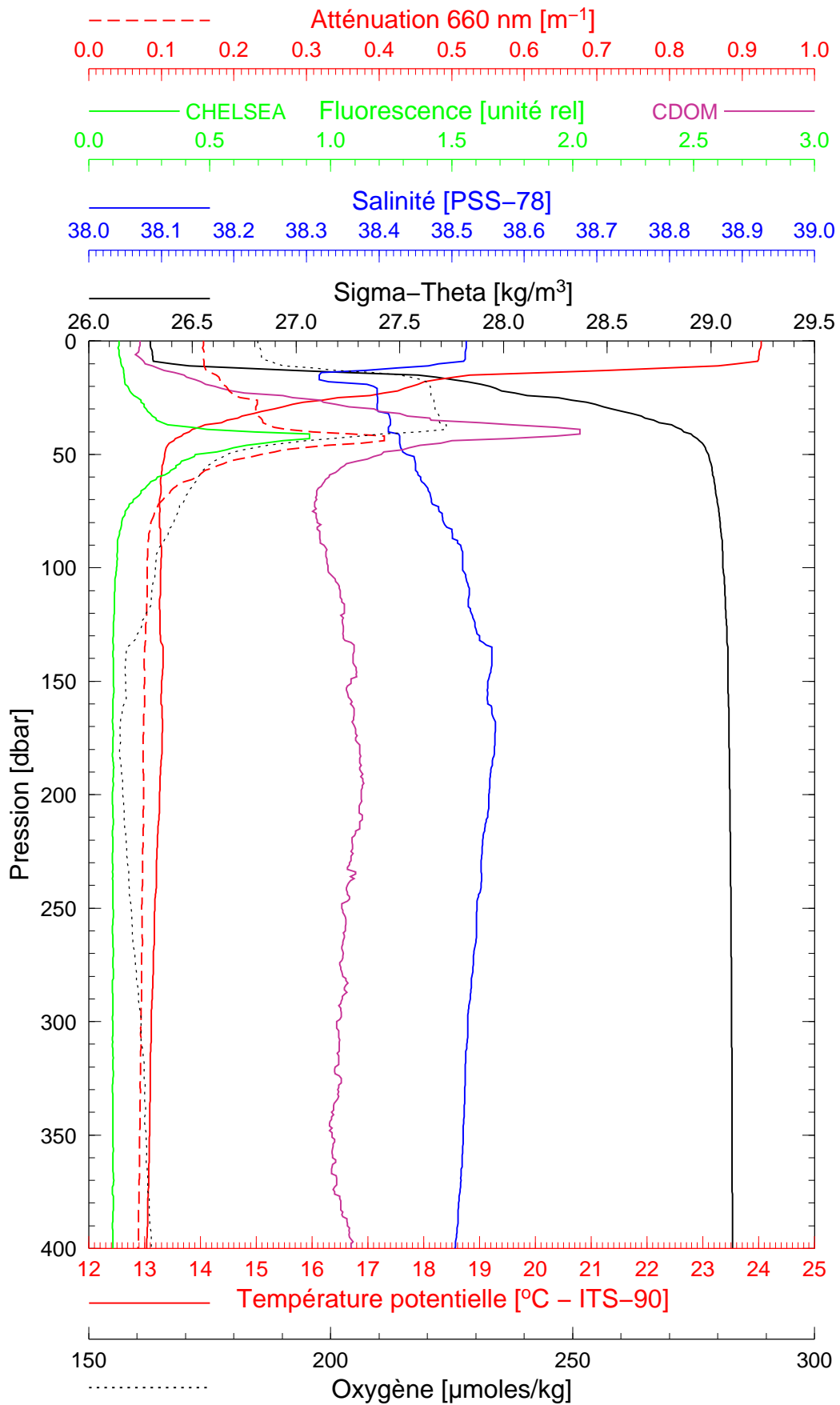
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Boussole 55

08/07/2006

BOUS060708_01

BOUS003



Date 08/07/2006

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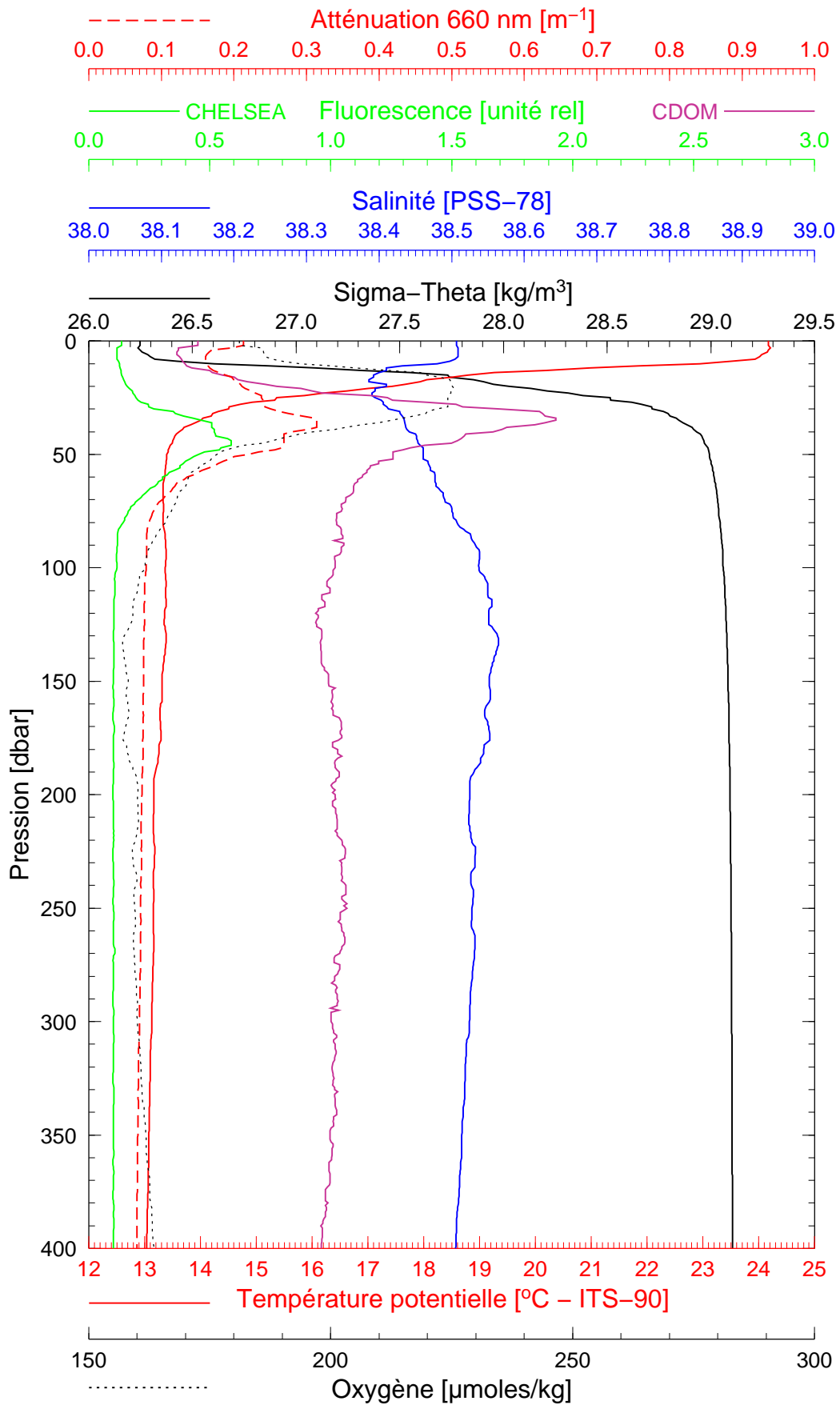
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Boussole 55

08/07/2006

BOUS060708_02

BOUS004



Date 08/07/2006
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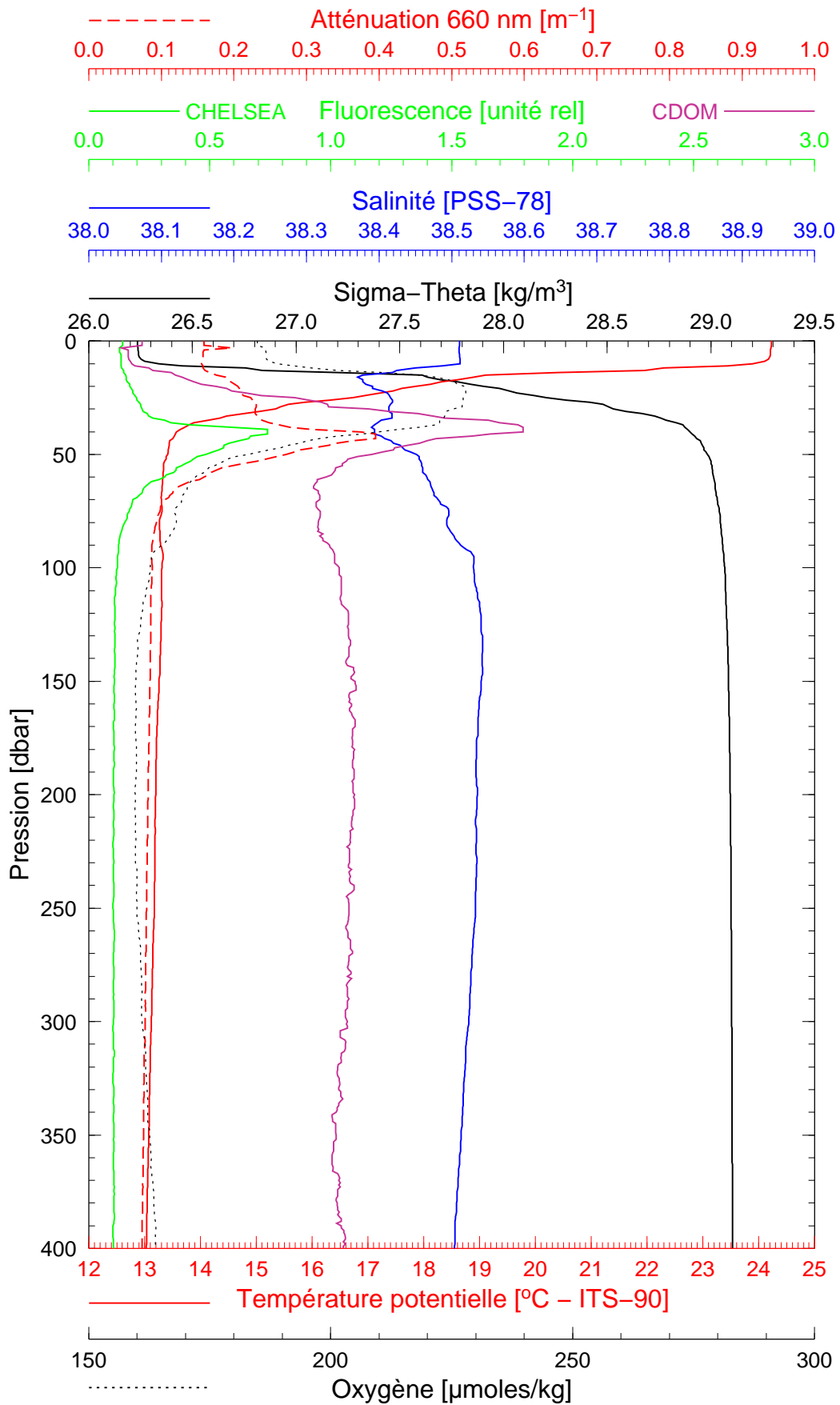
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Longitude 07°53.738 E

Boussole 55

09/07/2006

BOUS060709_01

BOUS005



Date 09/07/2006

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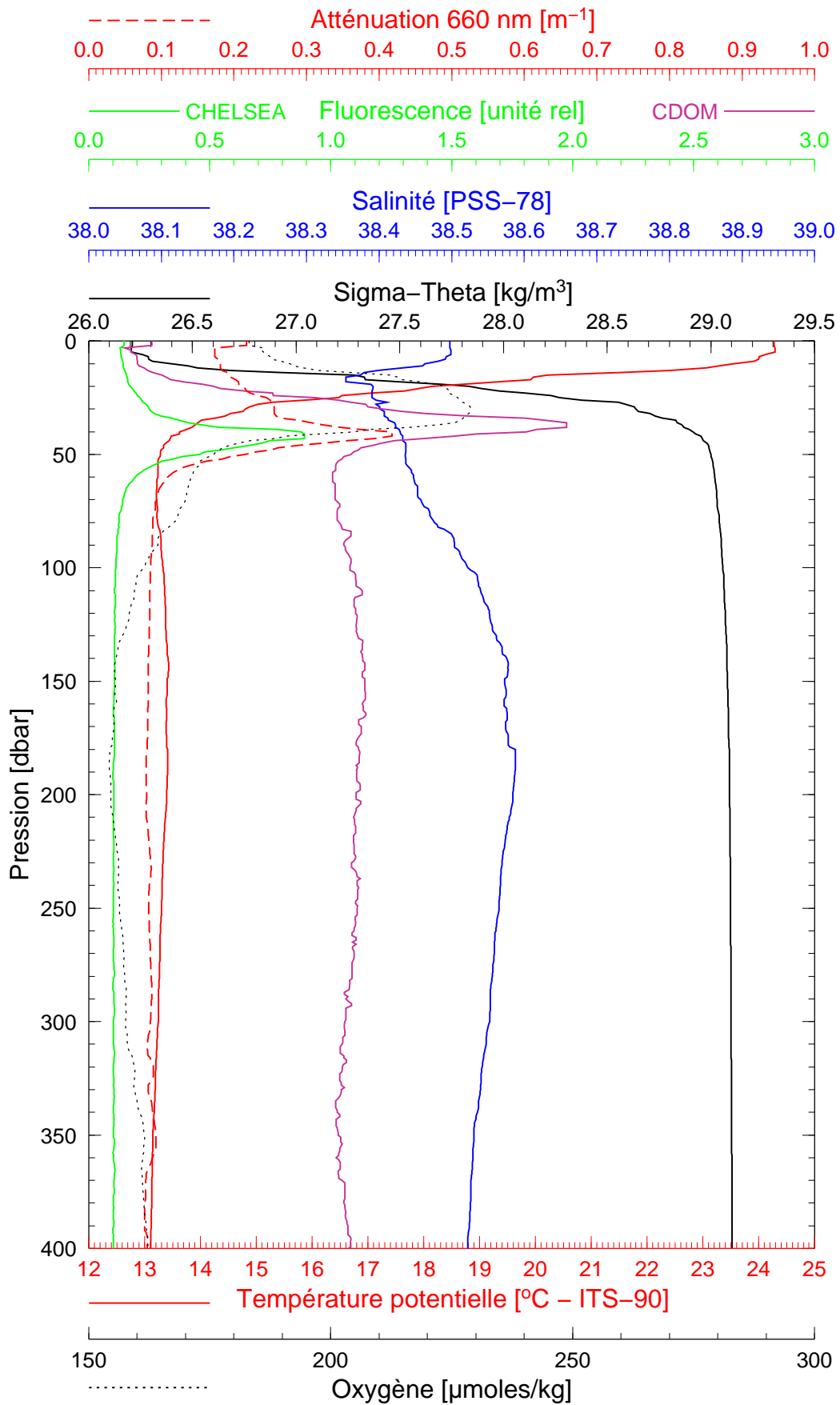
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Boussole 55

09/07/2006

BOUS060709_02

BOUS006



Date 09/07/2006

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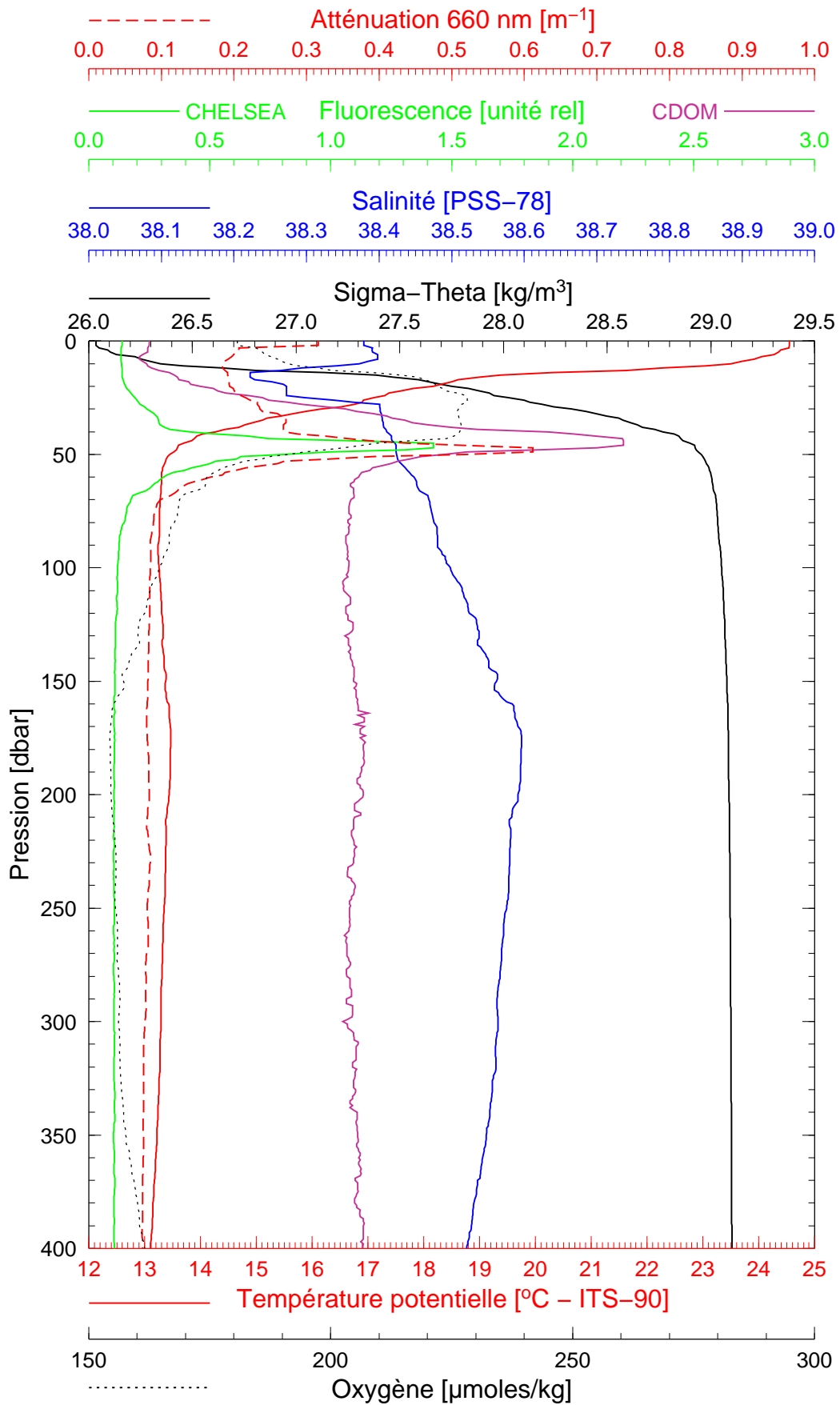
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Boussole 55

09/07/2006

BOUS060709_03

BOUS007



Date 09/07/2006

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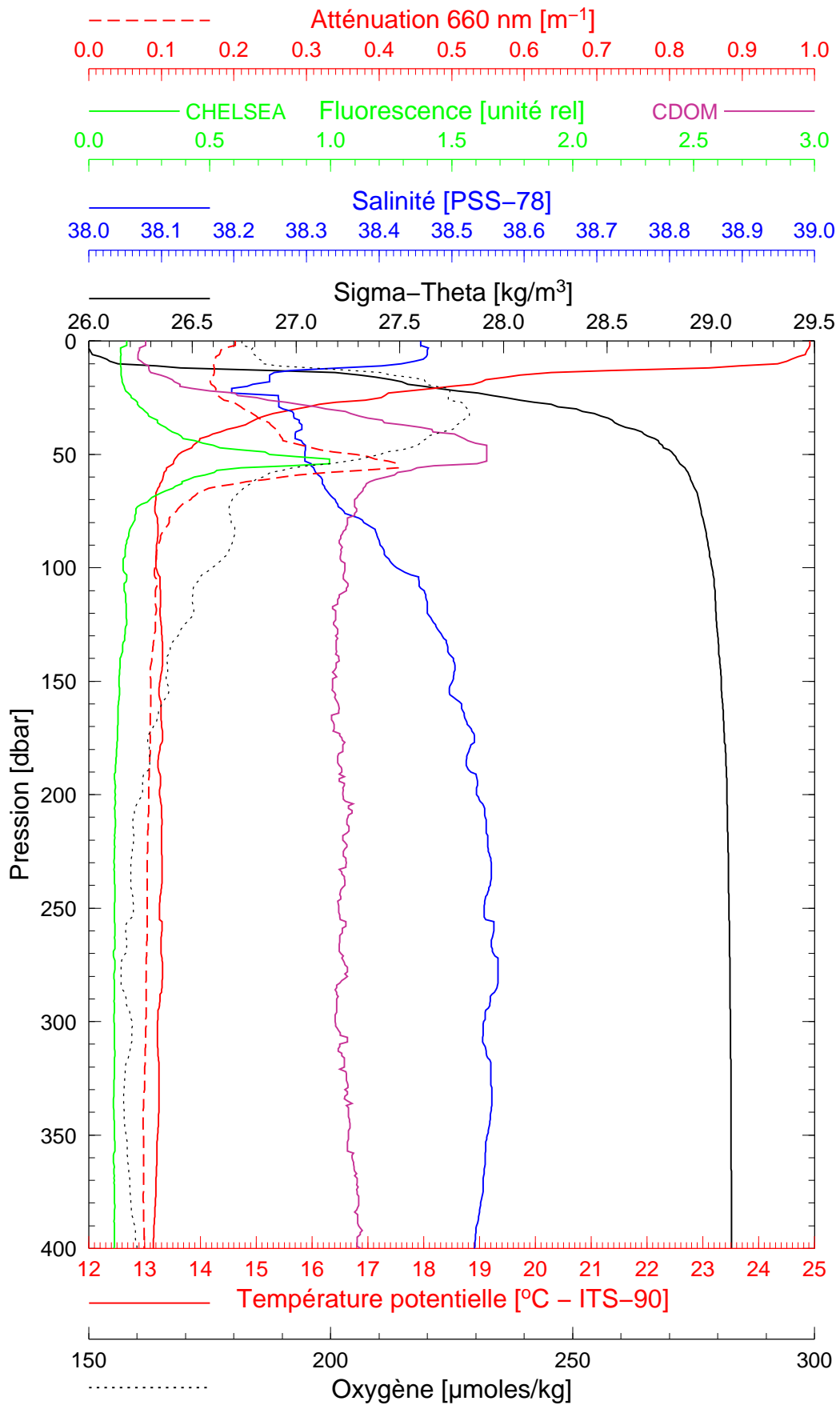
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Boussole 55

09/07/2006

BOUS060709_04

BOUS008



Date 09/07/2006
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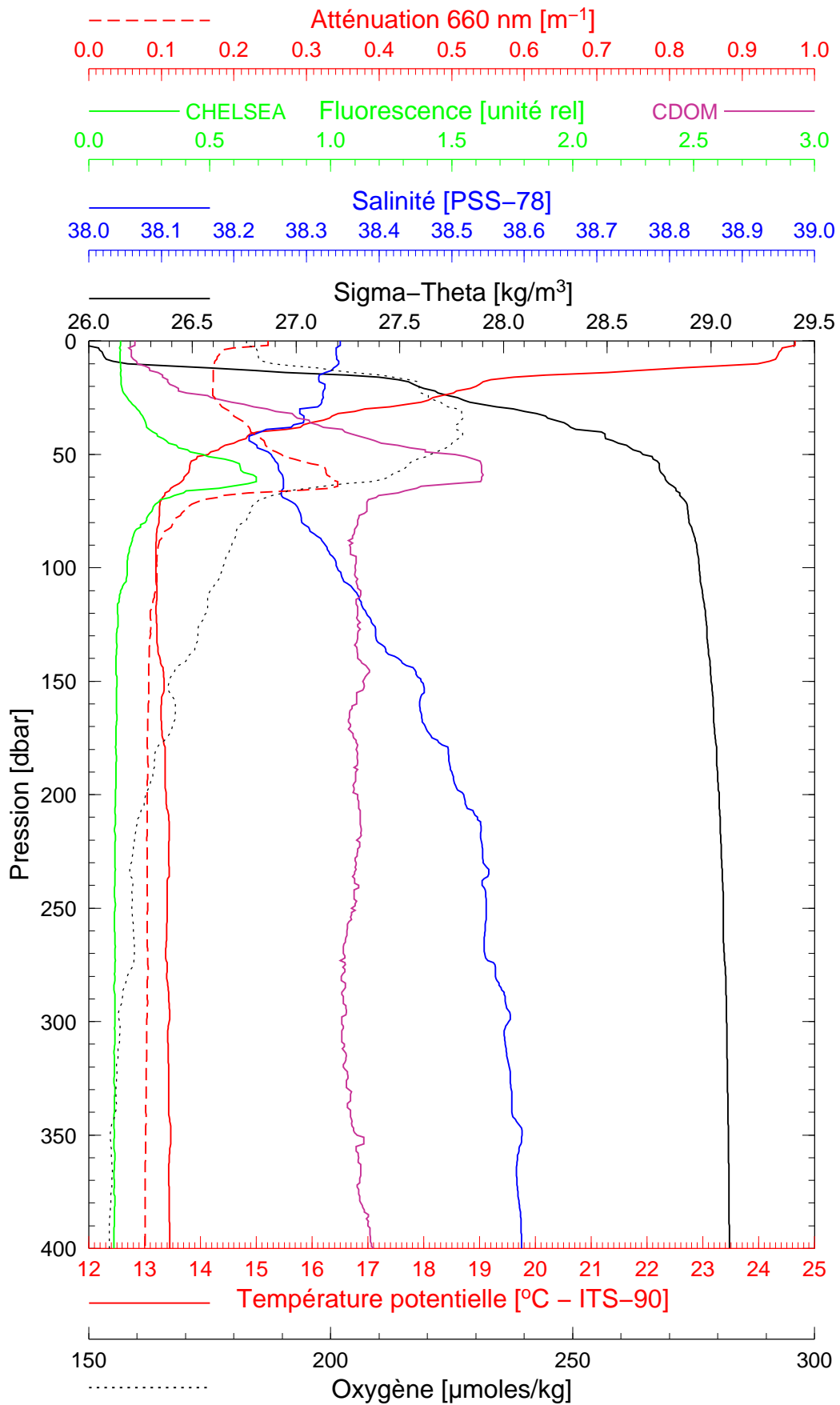
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Boussole 55

09/07/2006

BOUS060709_05

BOUS009



Date 09/07/2006
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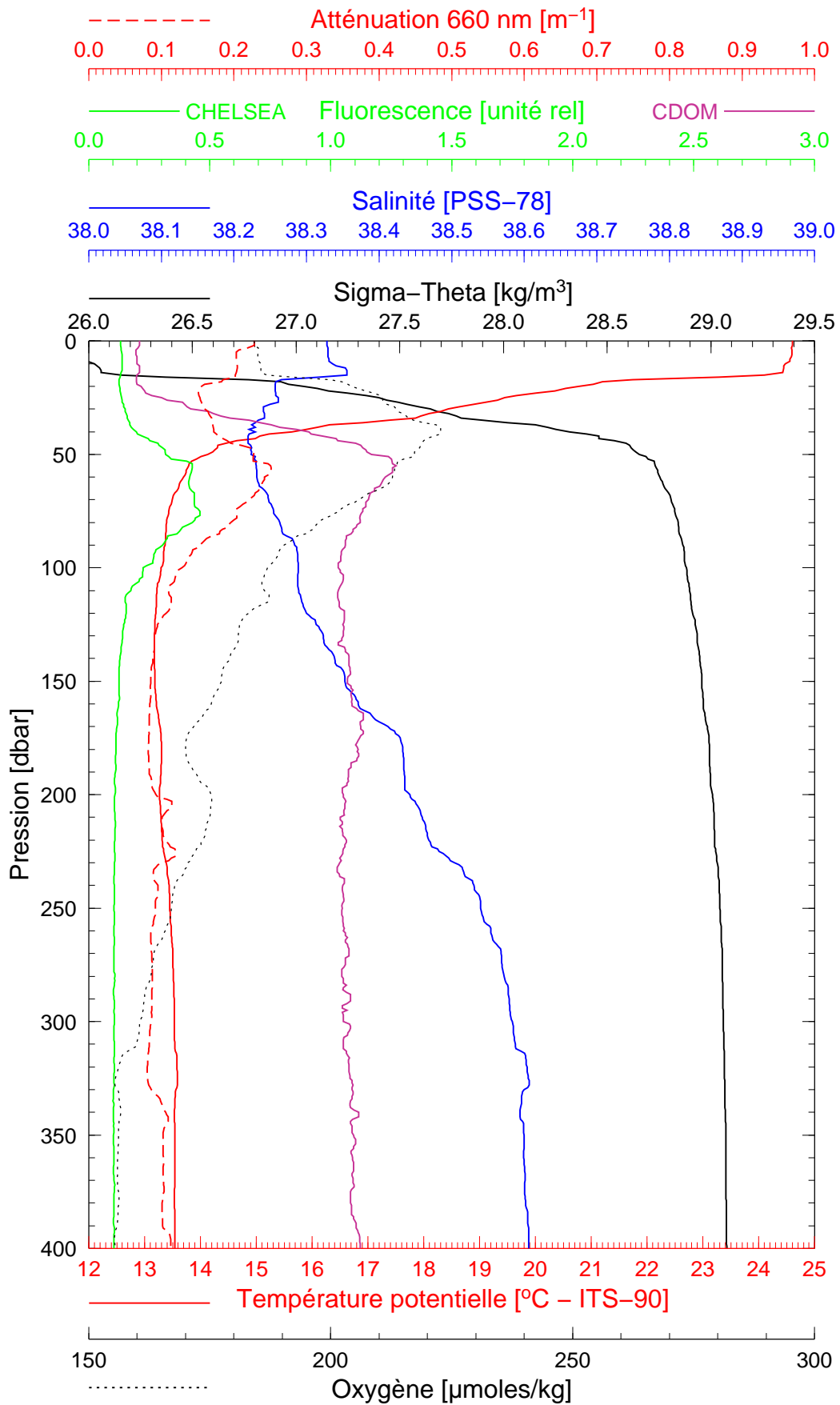
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Boussole 55

09/07/2006

BOUS060709_06

BOUS010



Date 09/07/2006

Latitude 43°37.405 N

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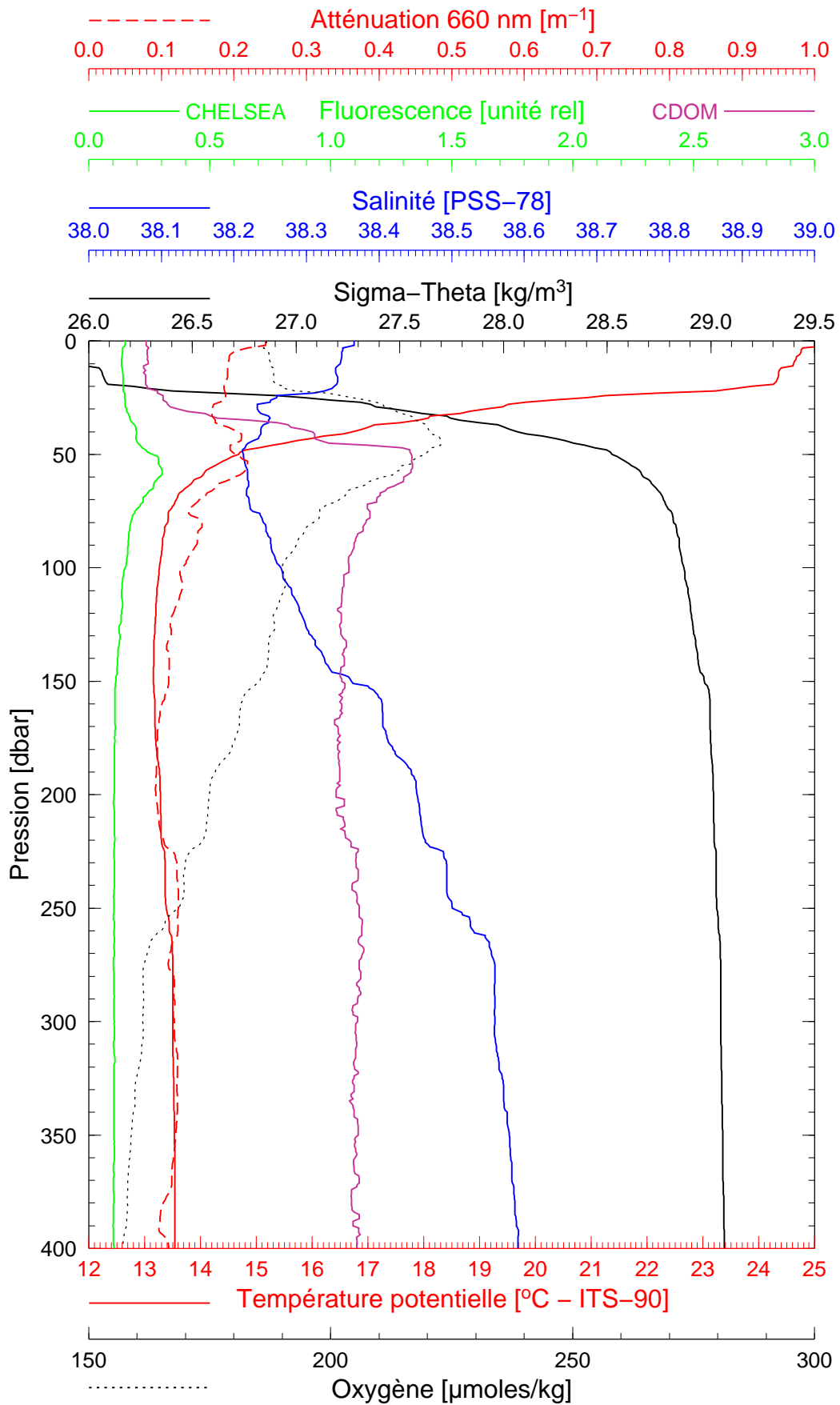
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Boussole 55

09/07/2006

BOUS060709_07

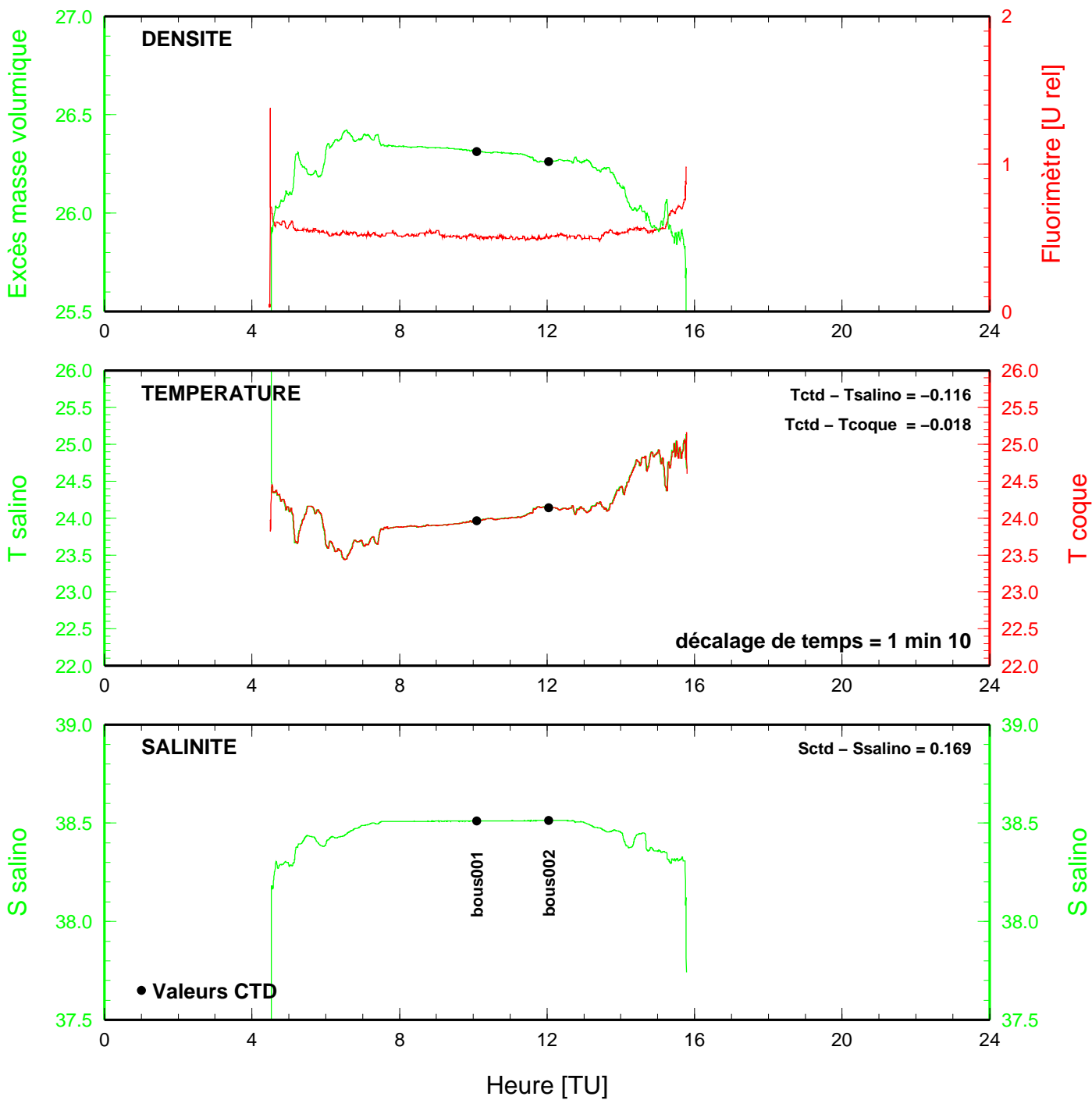
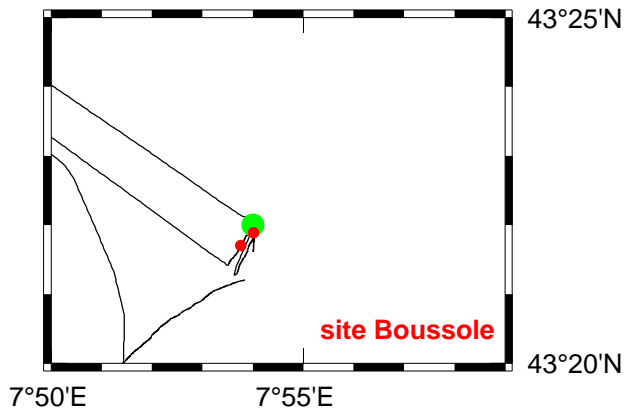
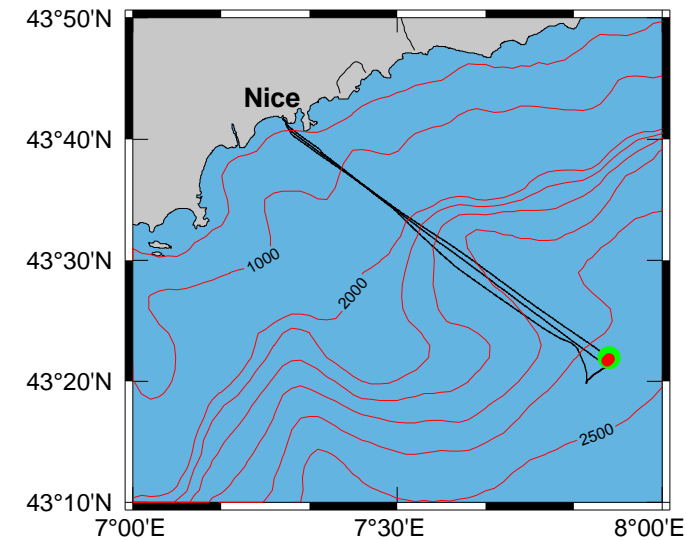
BOUS011



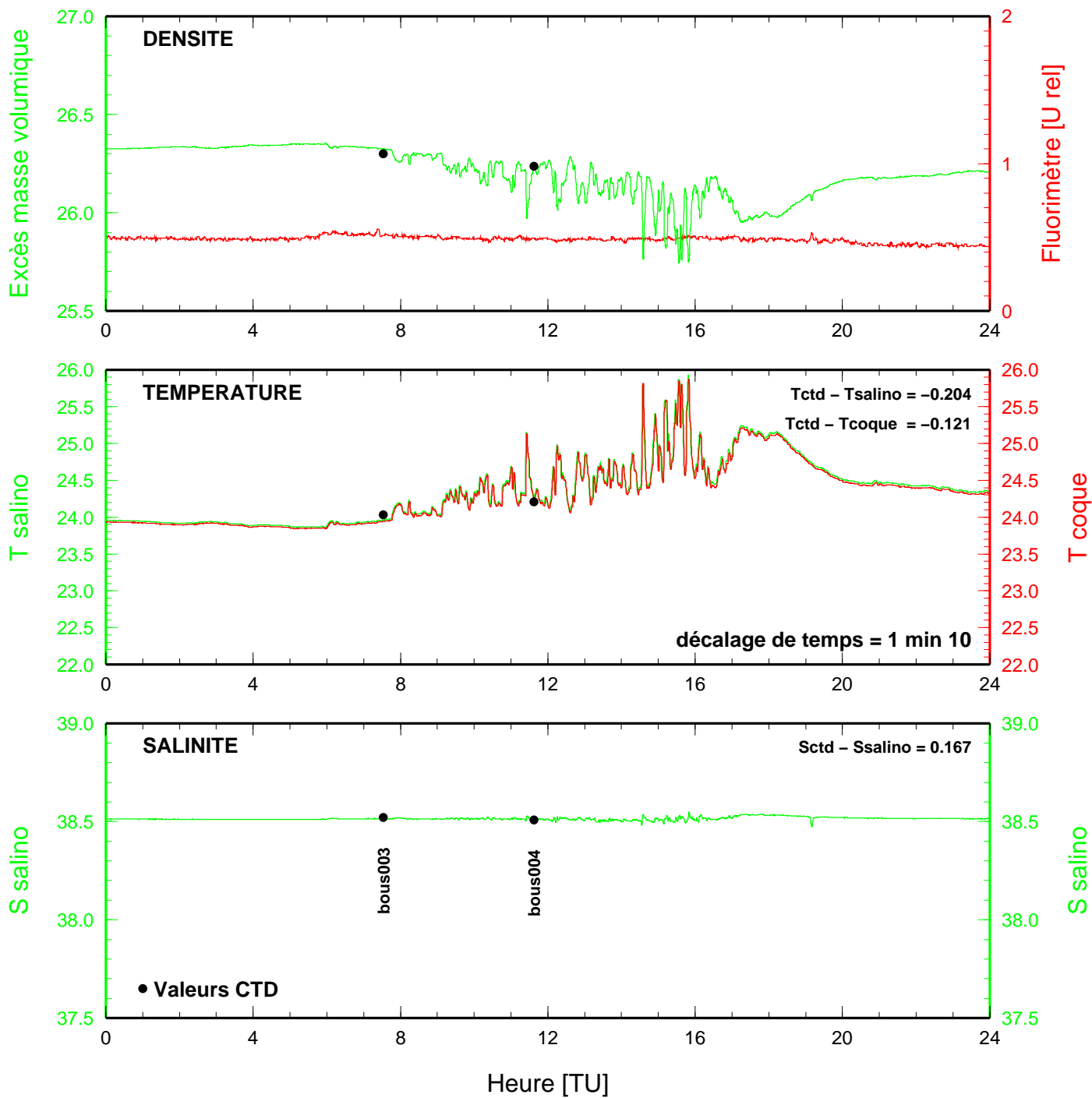
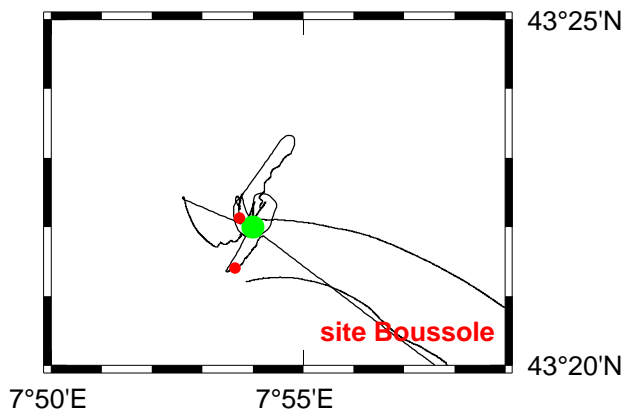
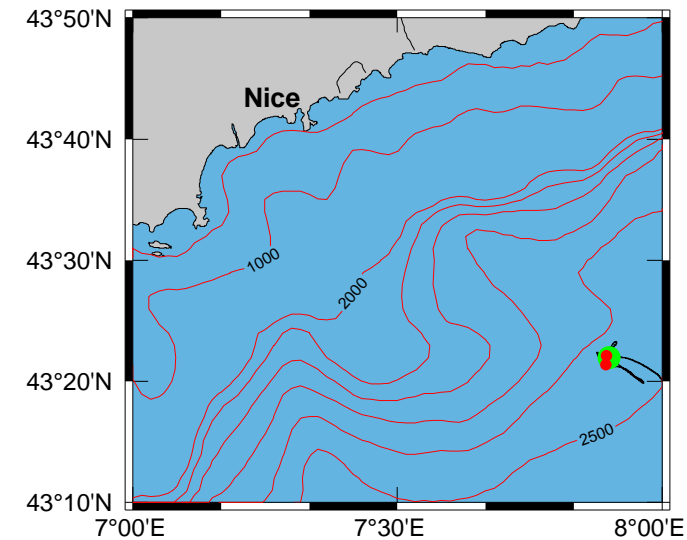
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Longitude 07°20.651 E

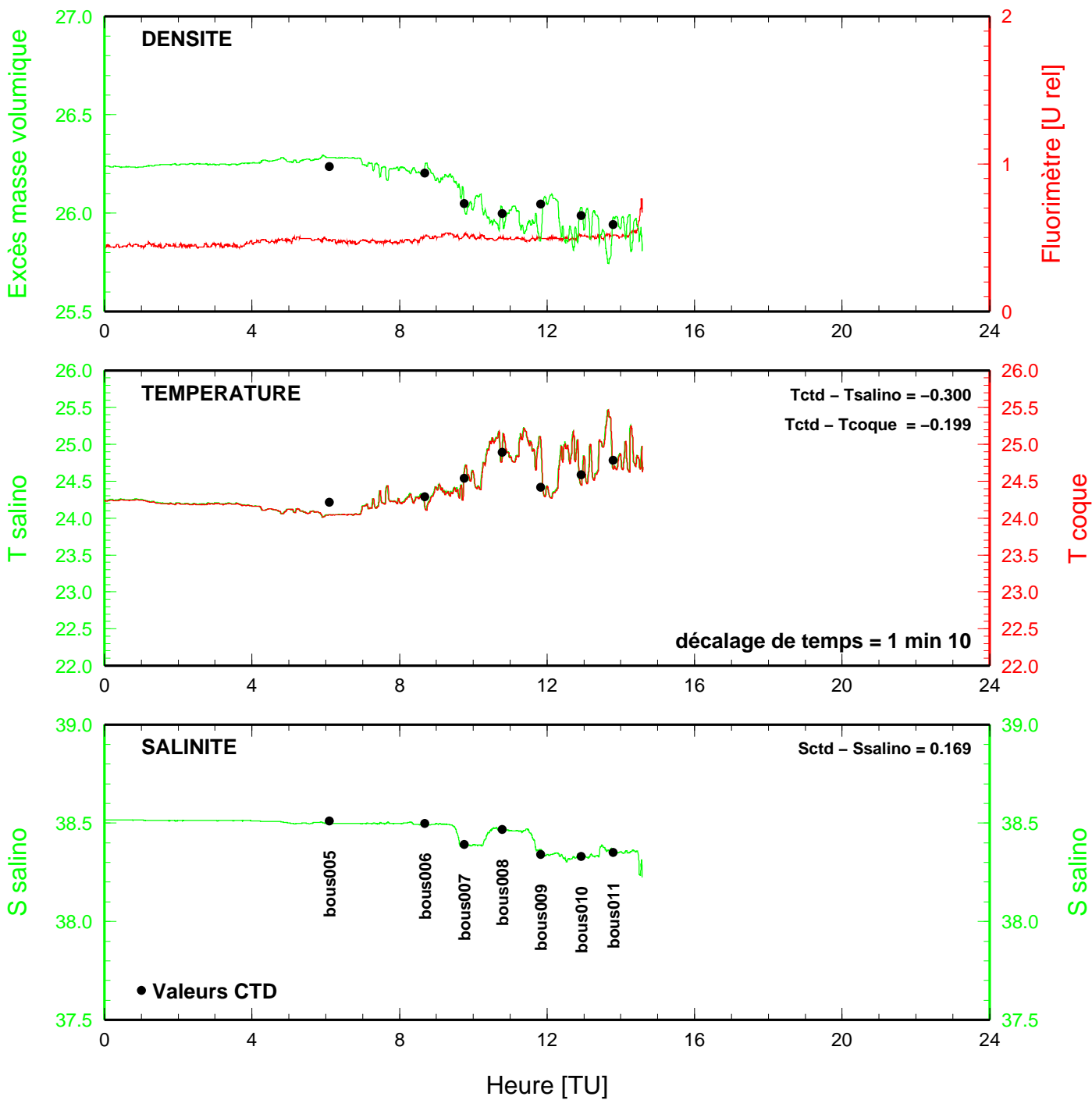
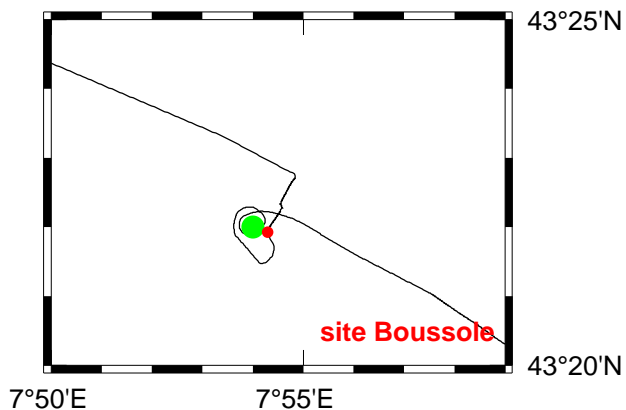
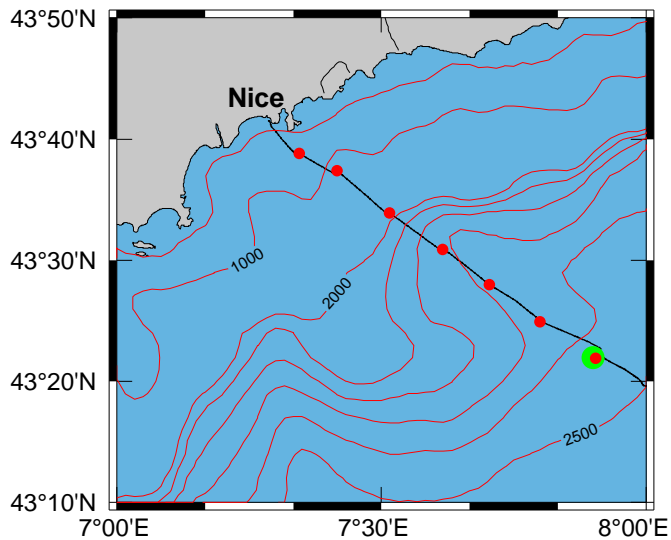
BOUSSOLE 55 07 juillet 2006



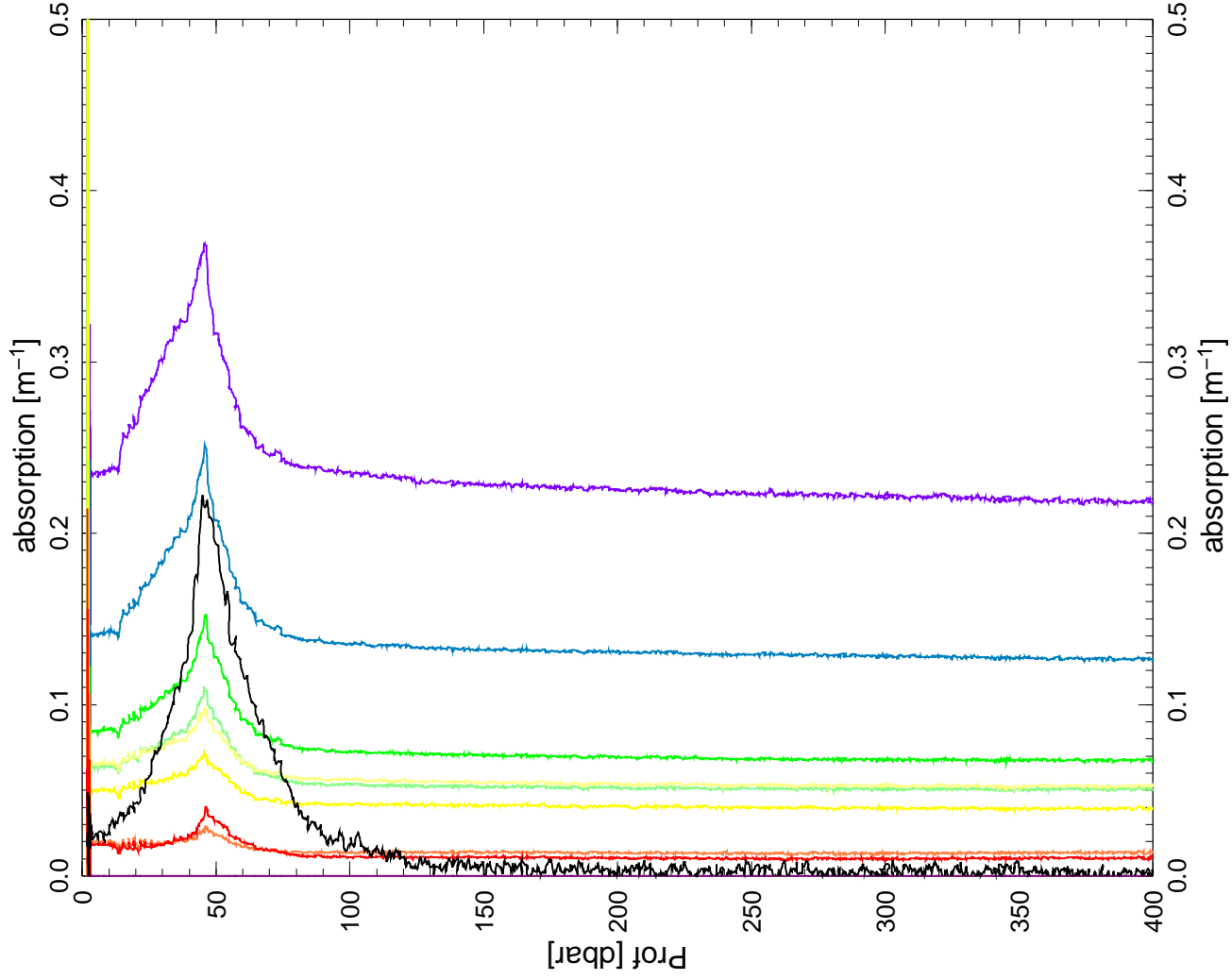
BOUSSOLE 55 08 juillet 2006



BOUSSOLE 55 09 juillet 2006

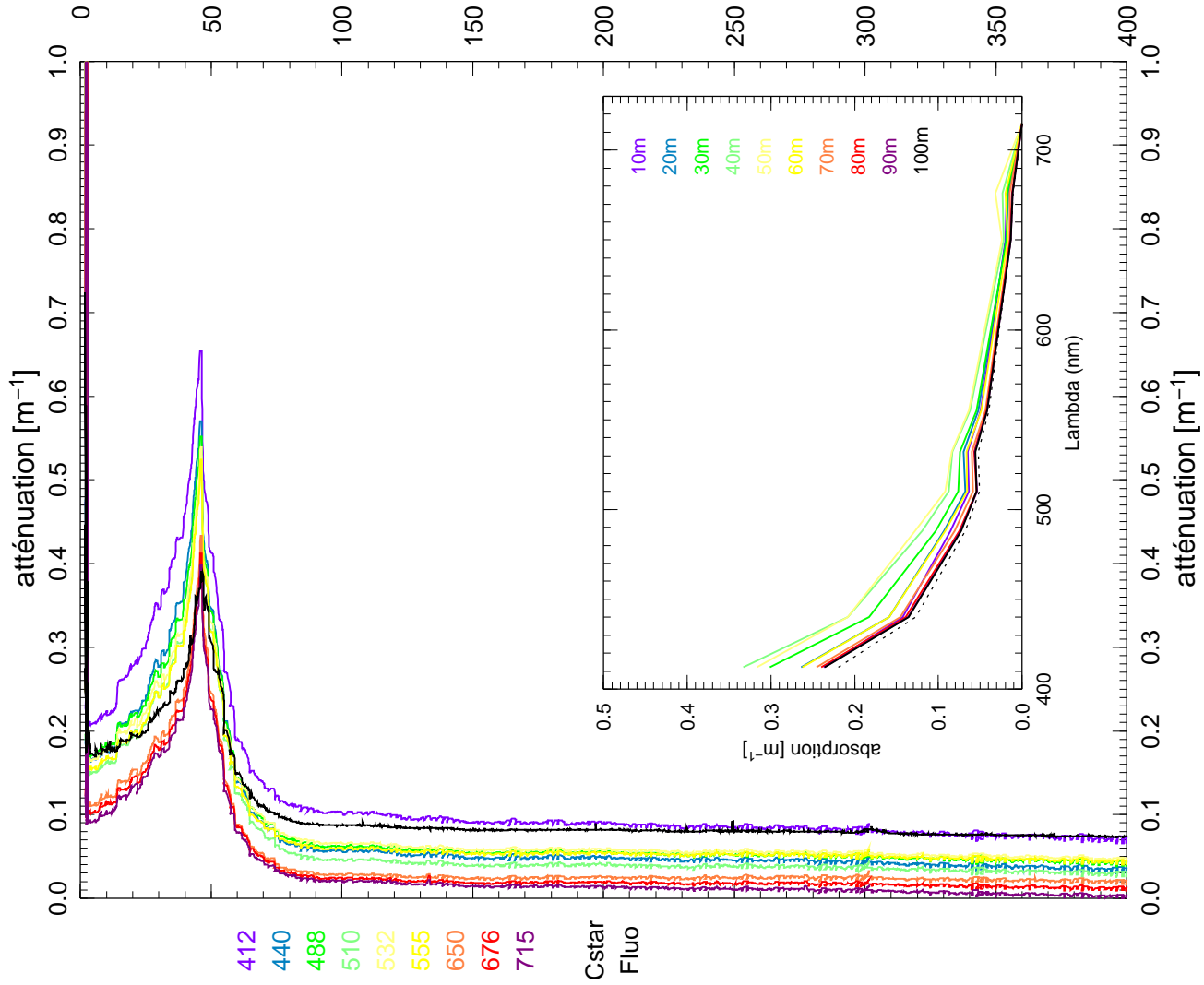


Boussole 55 Jul 07 2006 ac9001 bous001

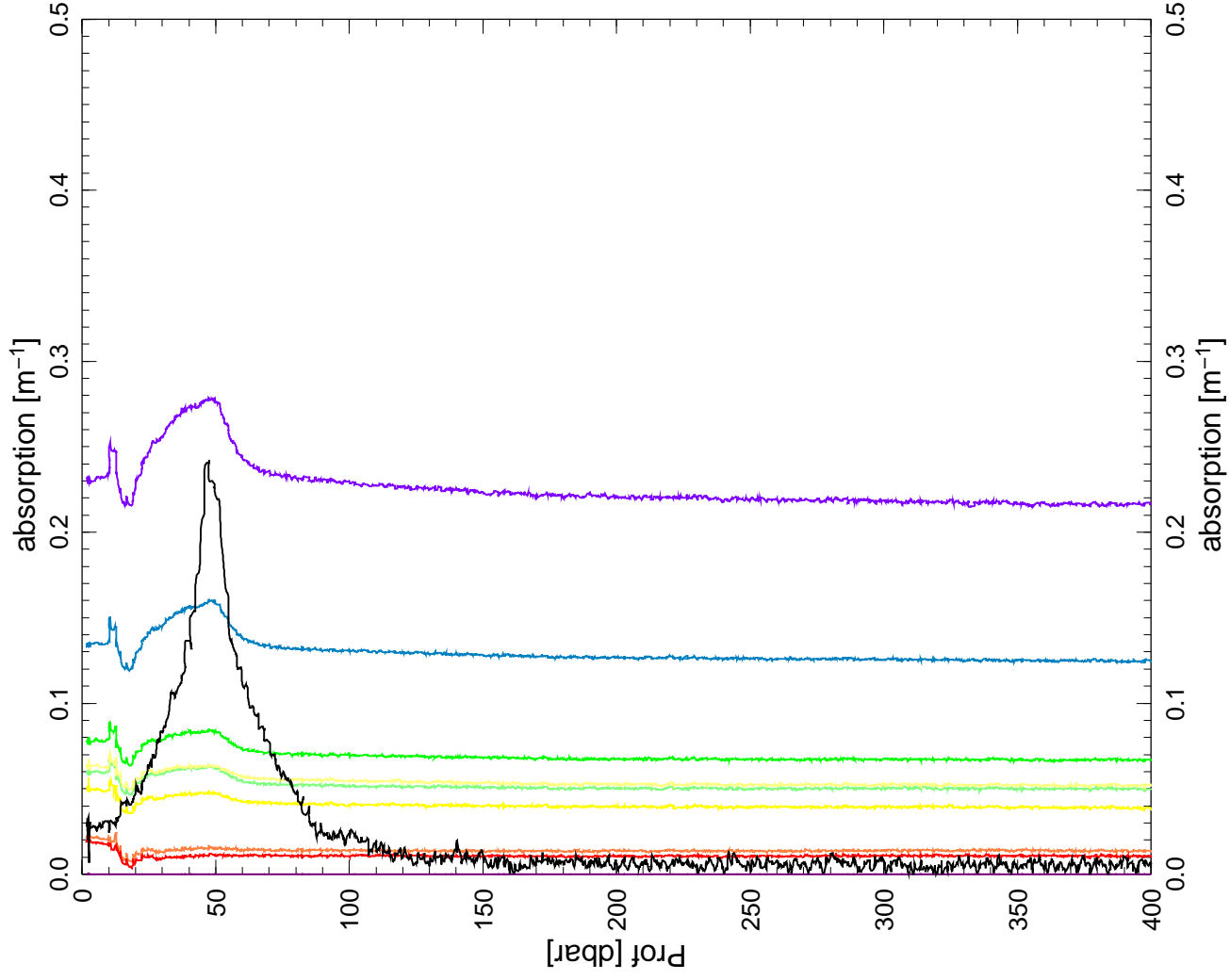


Fluorescence [u rel]
10⁻¹ 10⁰ 10¹

Corrections TS et diffusion : $a_\lambda = a_\lambda - a_{715}$

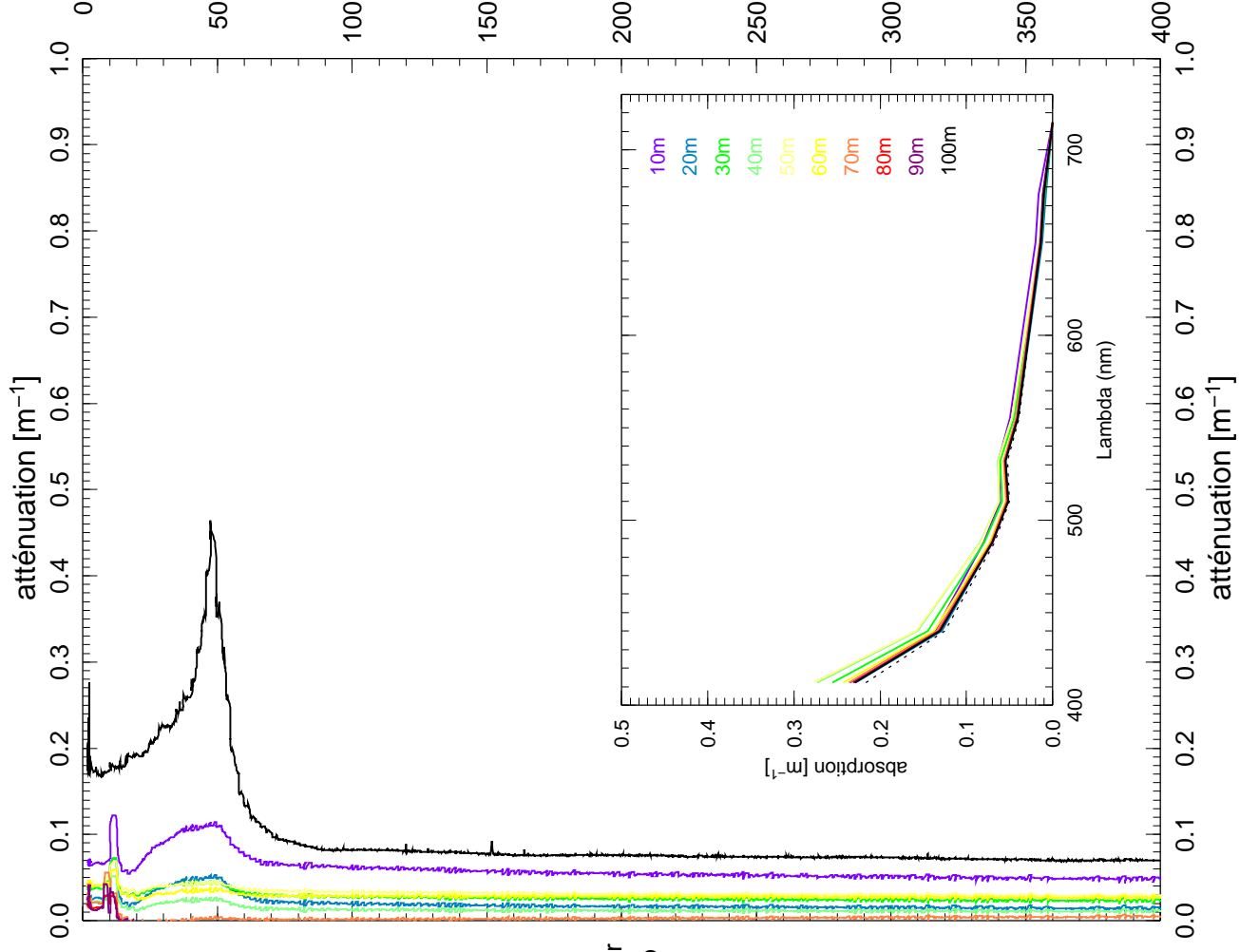


Cstar 660 nm [m⁻¹]
attenuation [m⁻¹]
1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1 0.0



Fluorescence [μ rel]

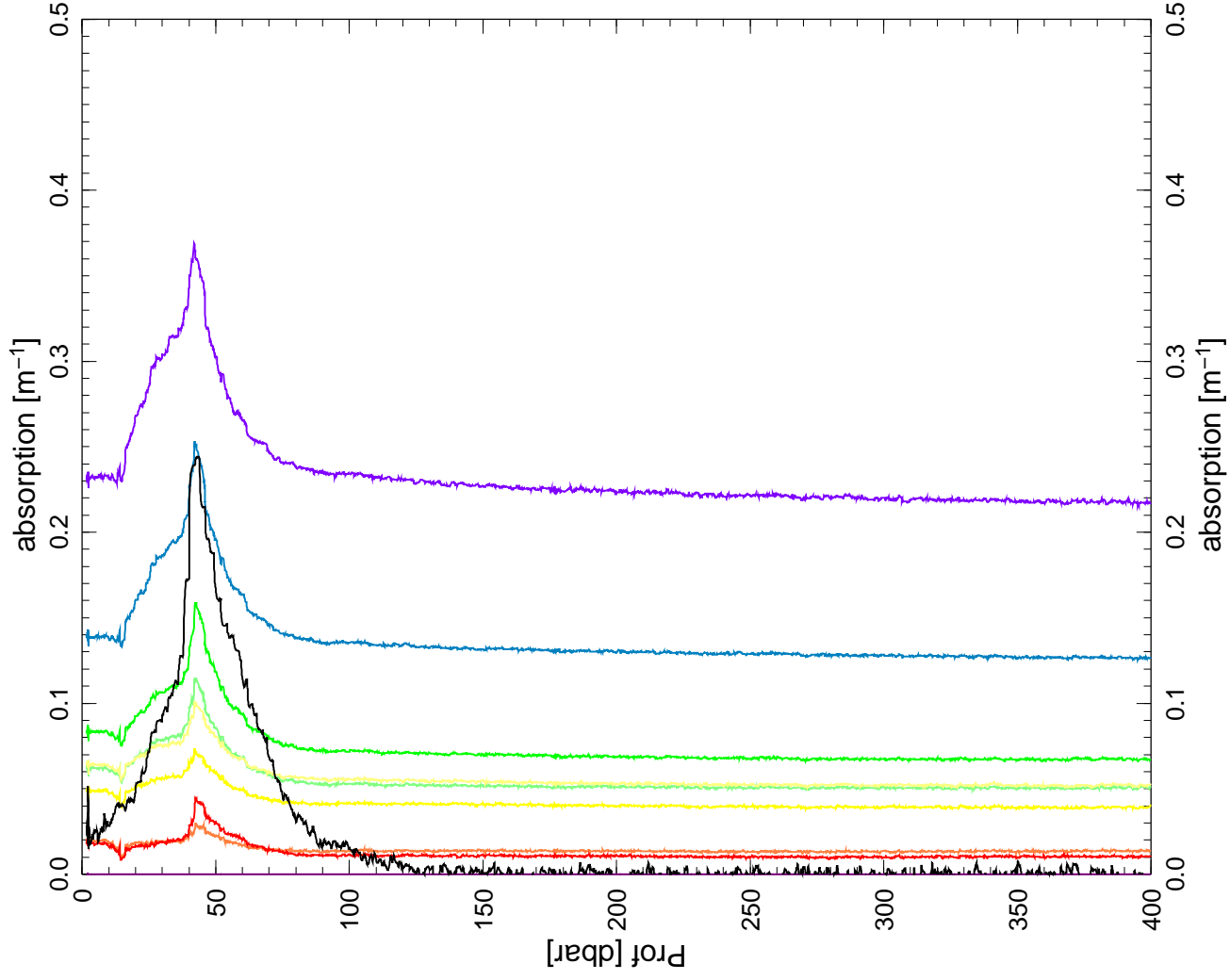
10^{-1} 10^0 10^1



atténuation [m^{-1}]

Cstar 660 nm [m^{-1}]

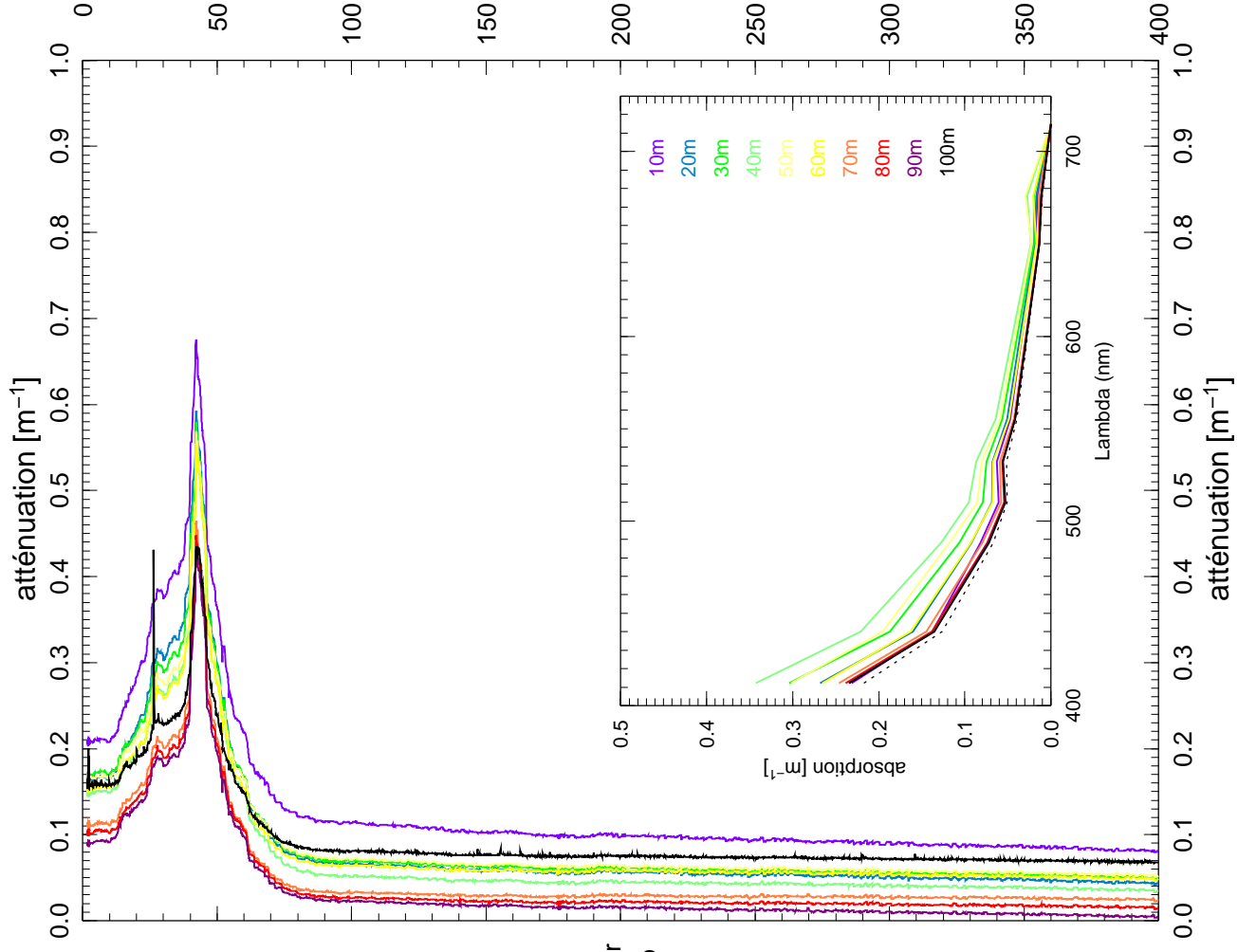
Boussole 55 Jul 08 2006 ac9003 bous003



Fluorescence [μ rel]

10^{-1} 10^0 10^1

Corrections TS et diffusion : $a_\lambda = a_\lambda - a_{715}$

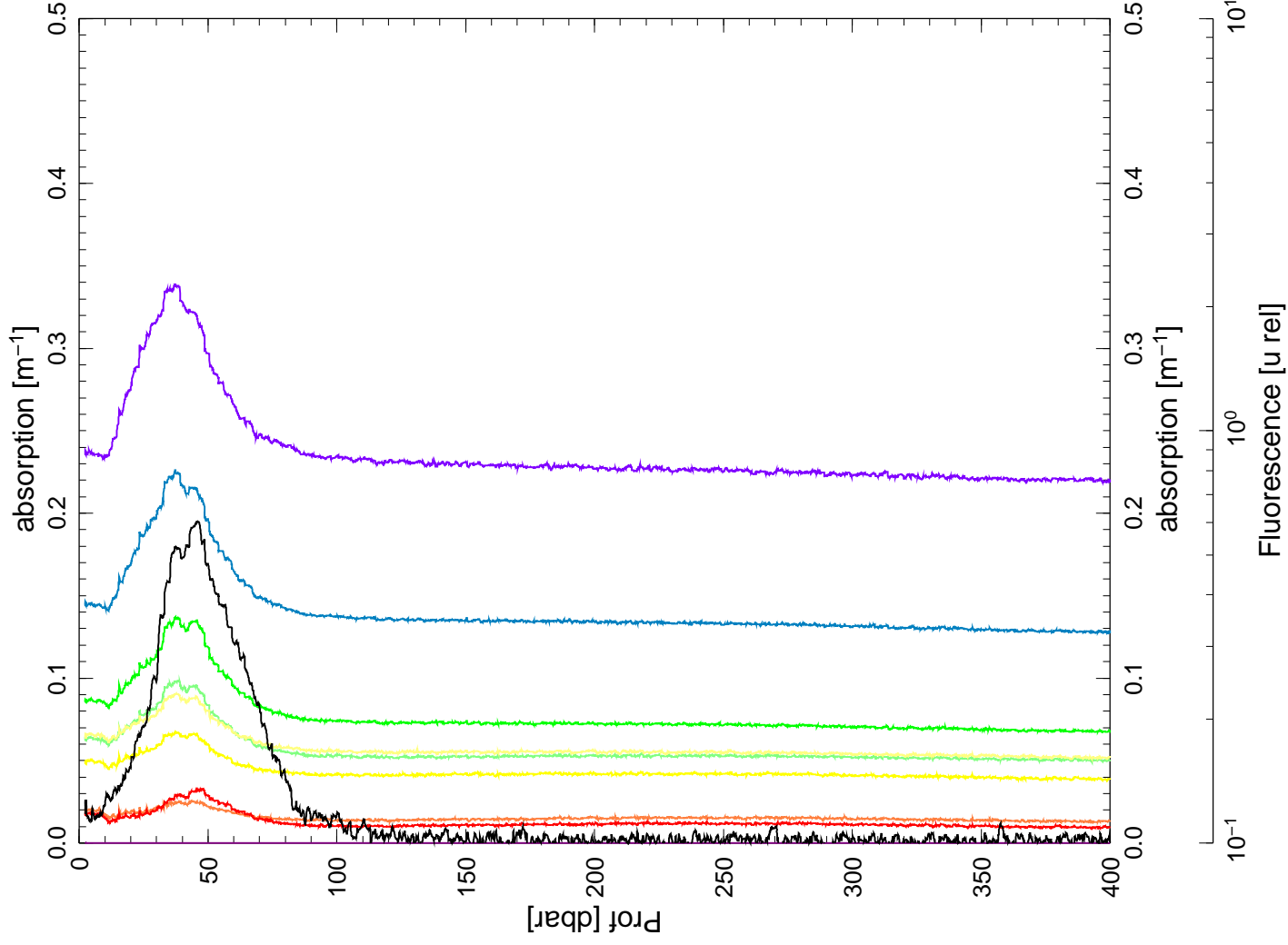


Cstar 660 nm [m^{-1}]

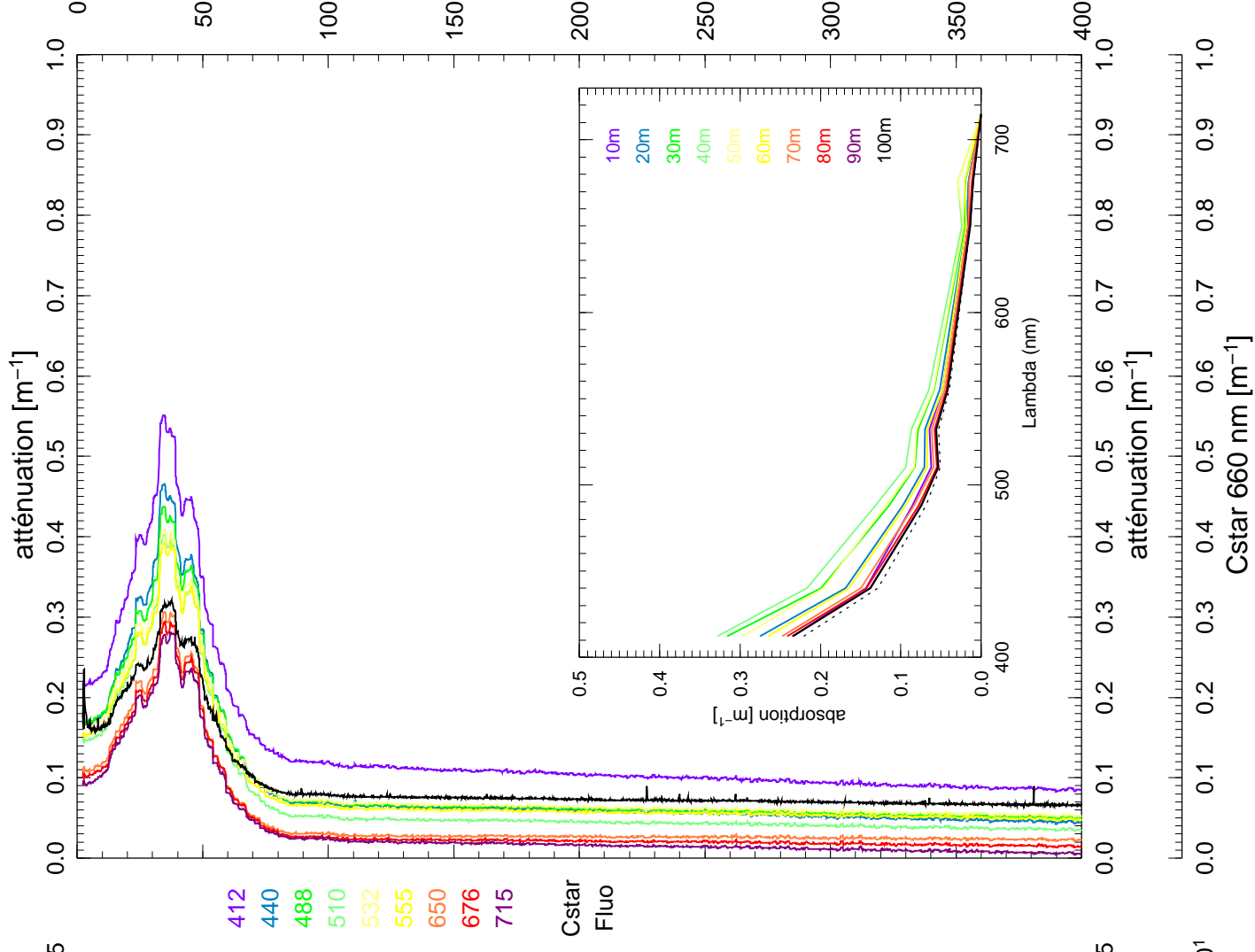
atténuation [m^{-1}]

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

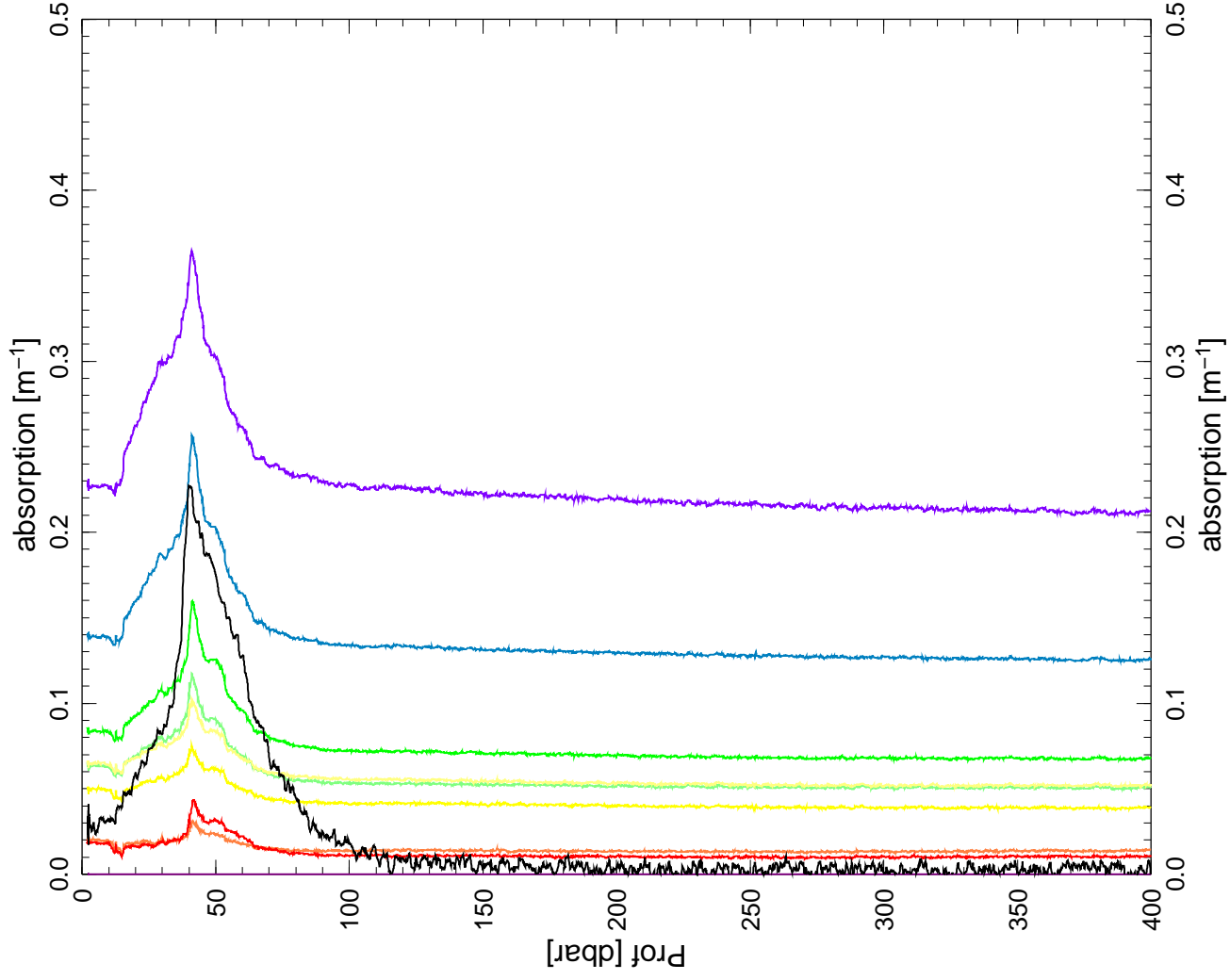
Boussole 55 Jul 08 2006 ac9004 bous004



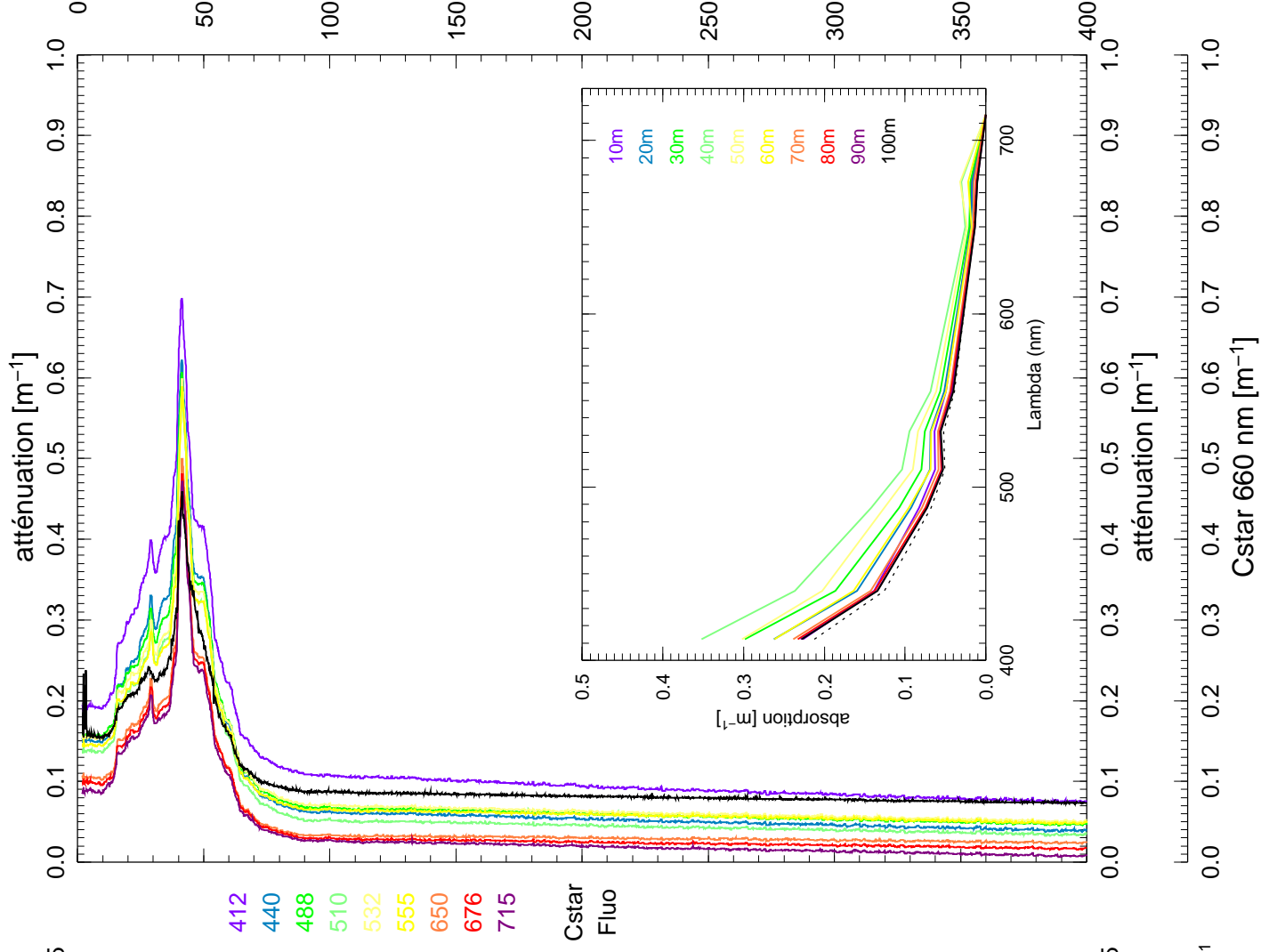
Corrections TS et diffusion : $a_\lambda = a_\lambda - a_{715}$



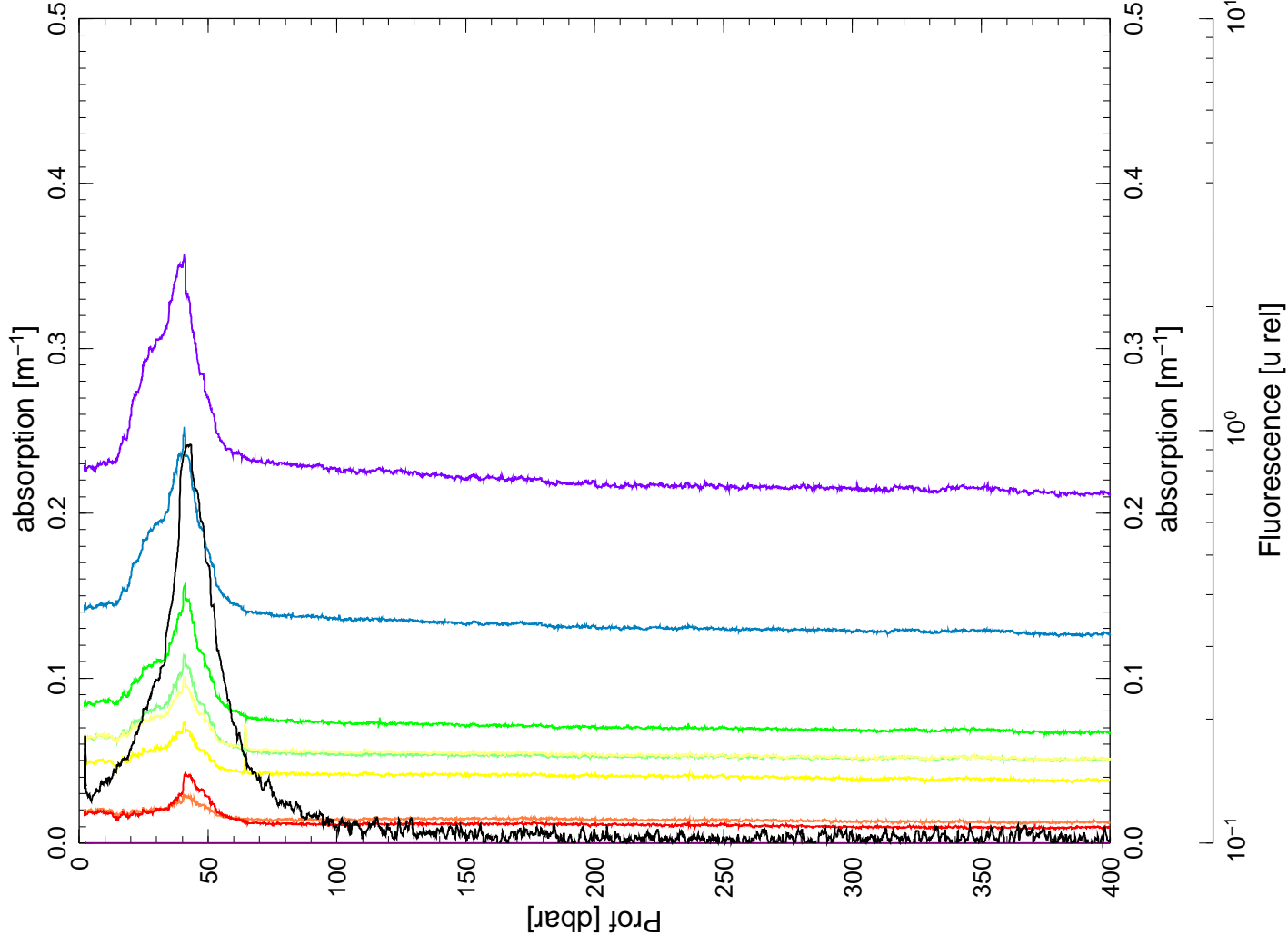
Boussole 55 Jul 09 2006 ac9005 bous005



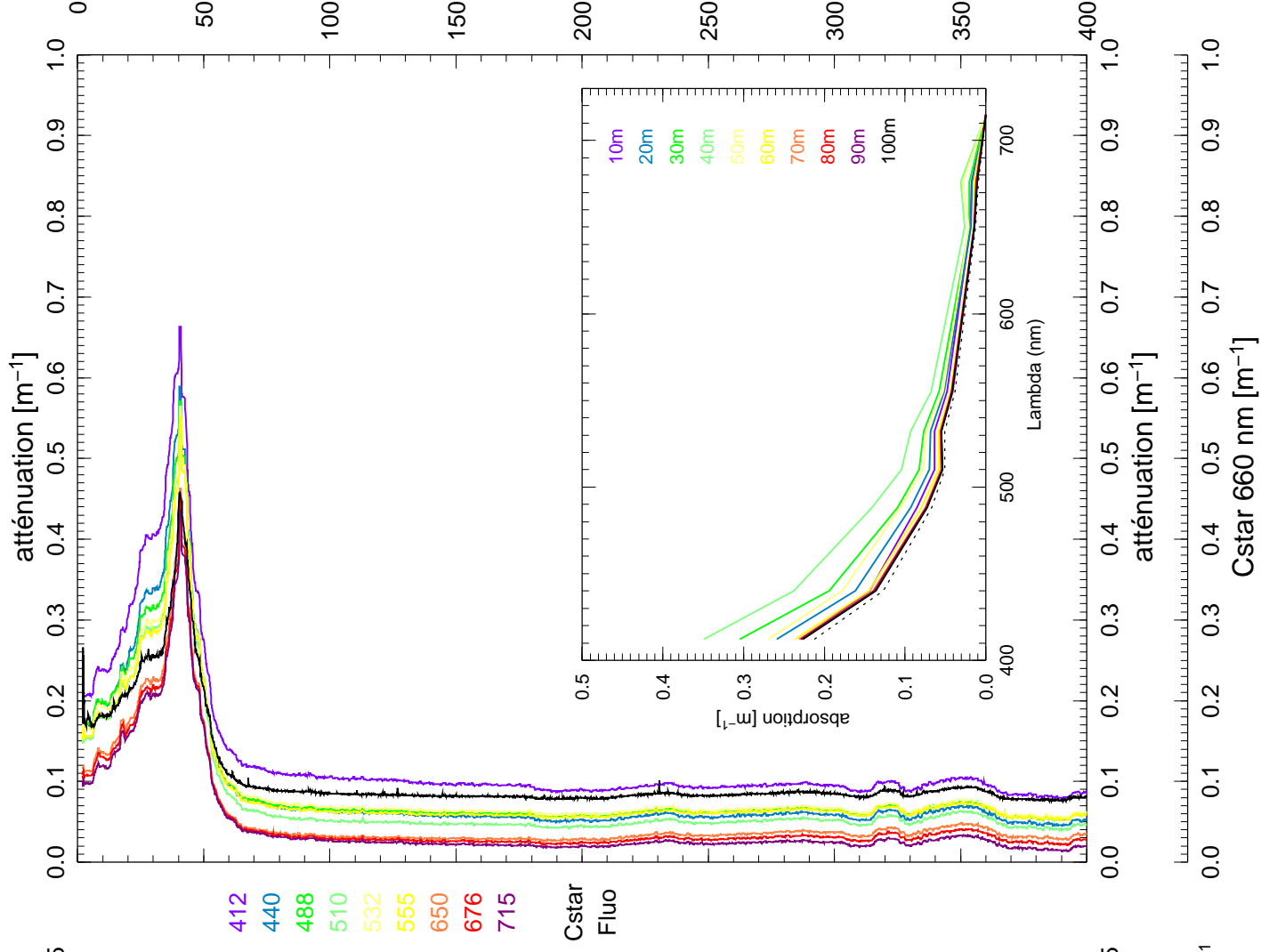
Corrections TS et diffusion : $a_\lambda = a_\lambda - a_{715}$



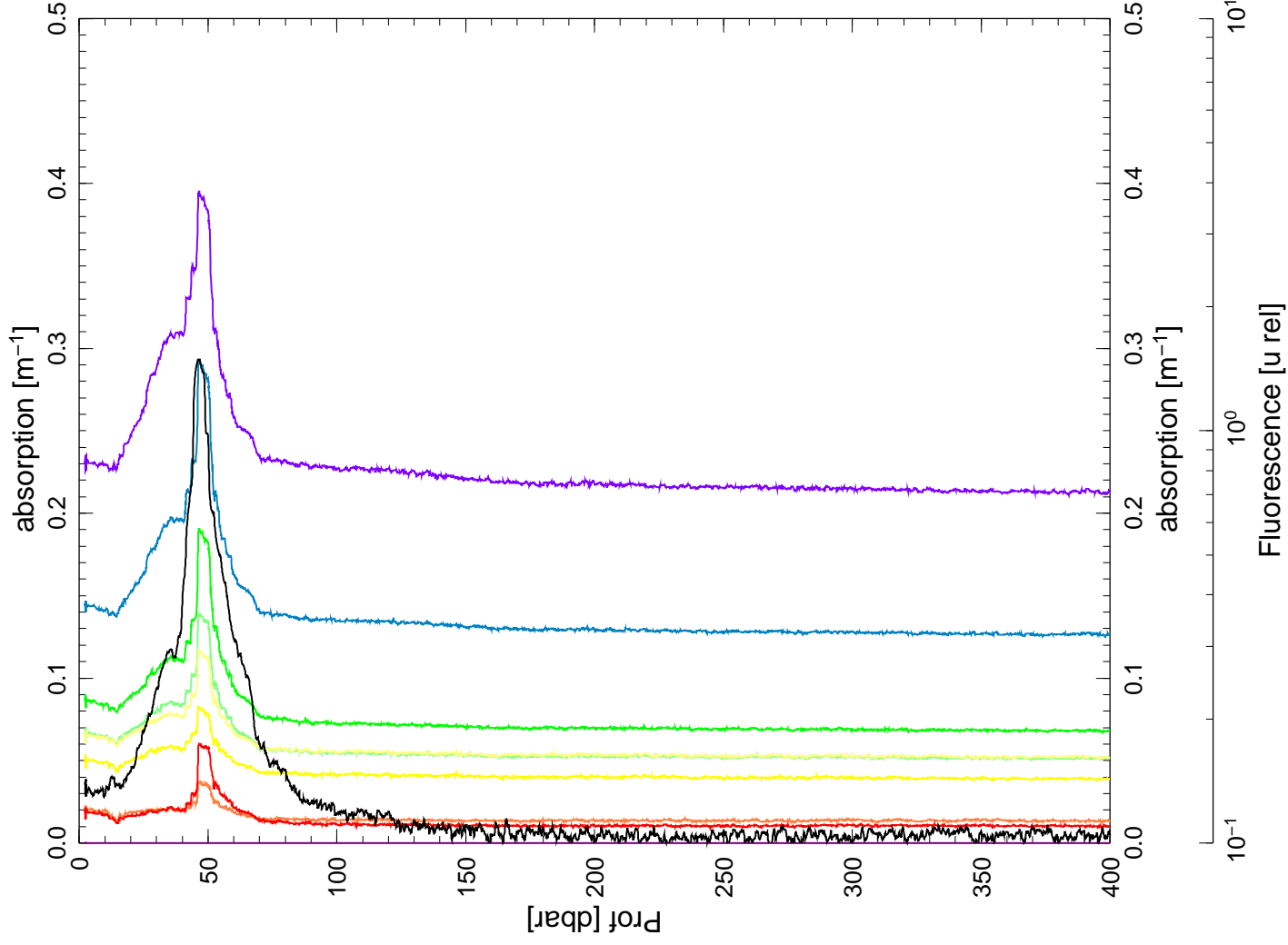
Boussole 55 Jul 09 2006 ac9006 bous006



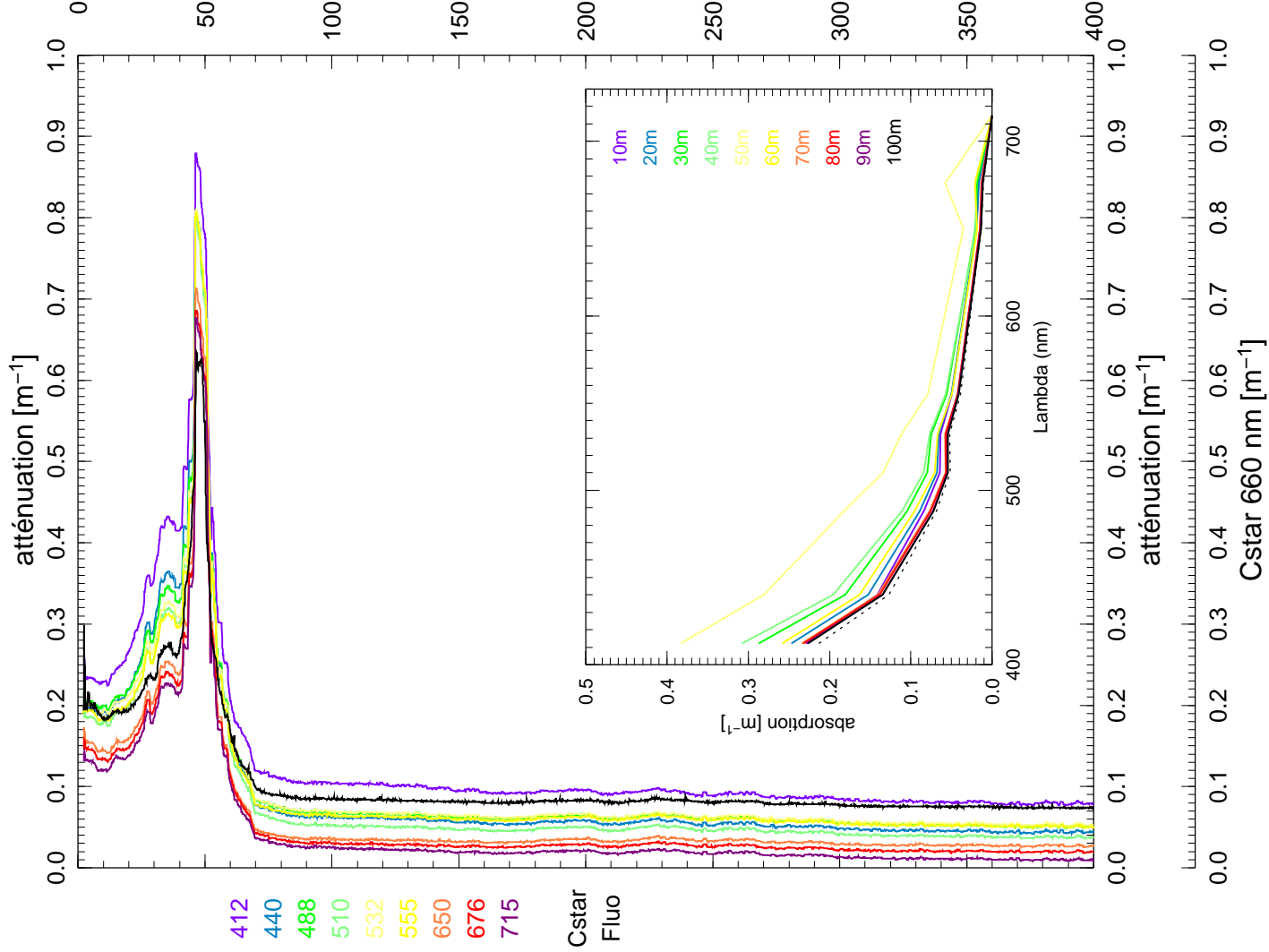
Corrections TS et diffusion : $a_\lambda = a_\lambda - a_{715}$

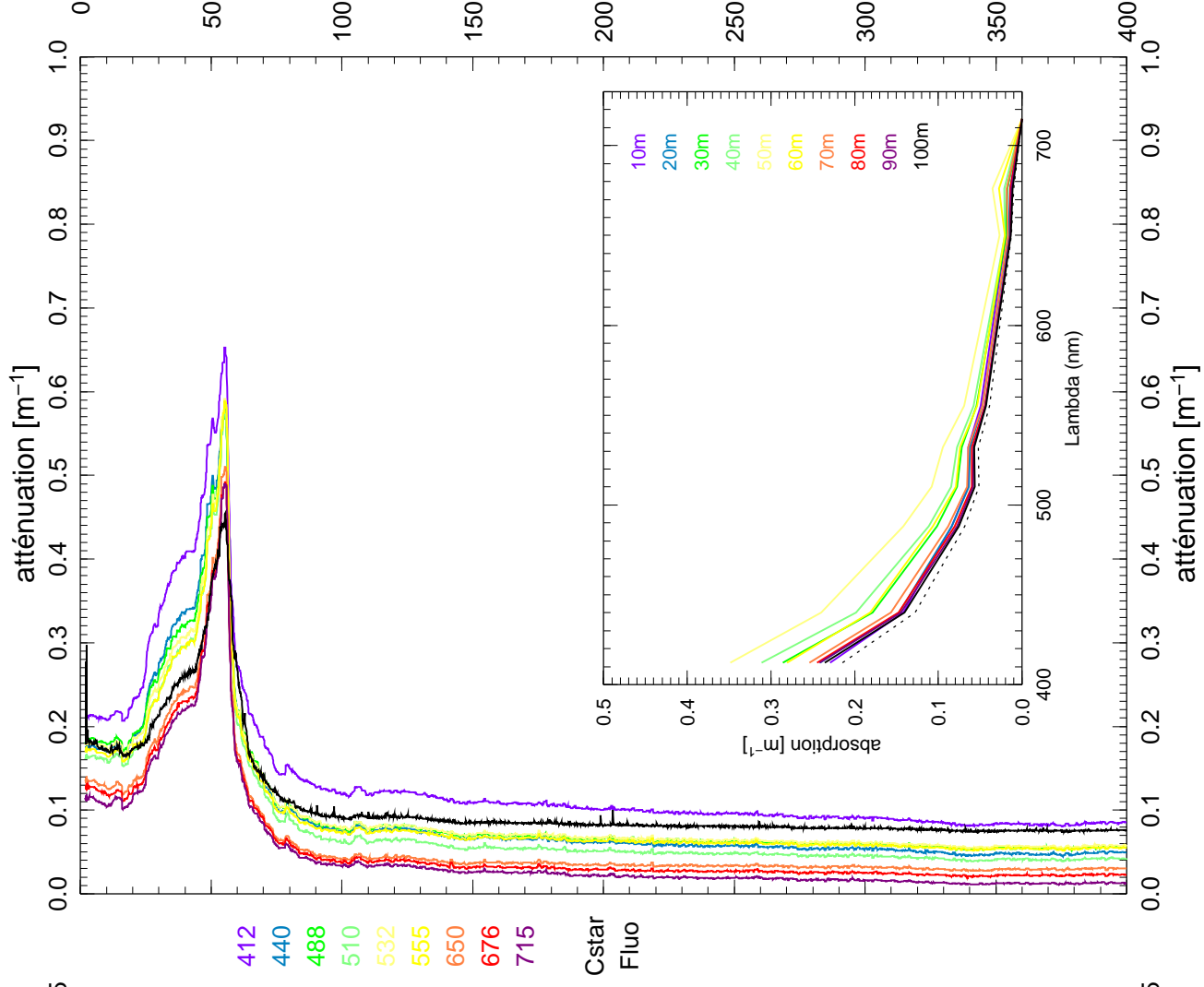
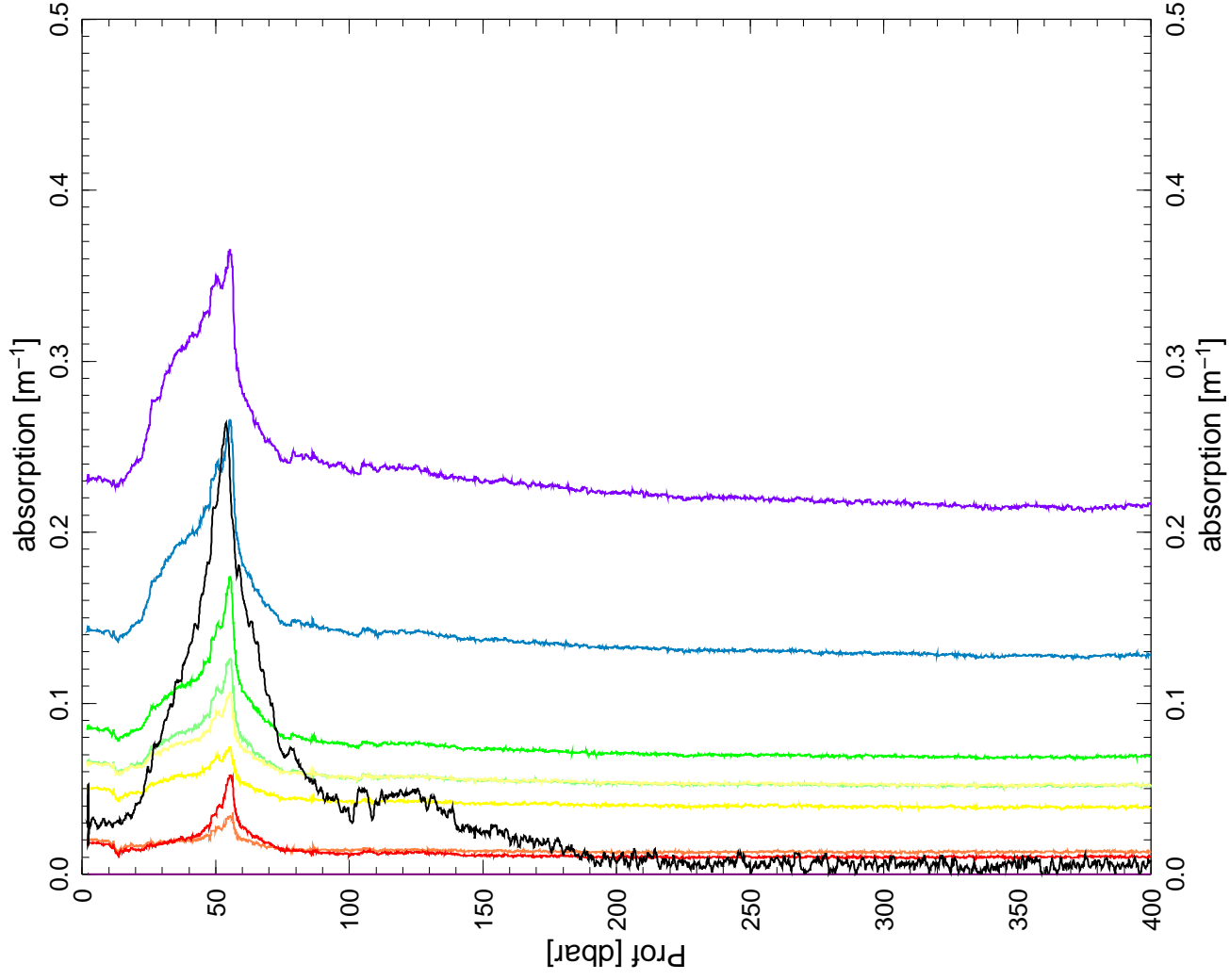


Boussole 55 Jul 09 2006 ac9007 bous007

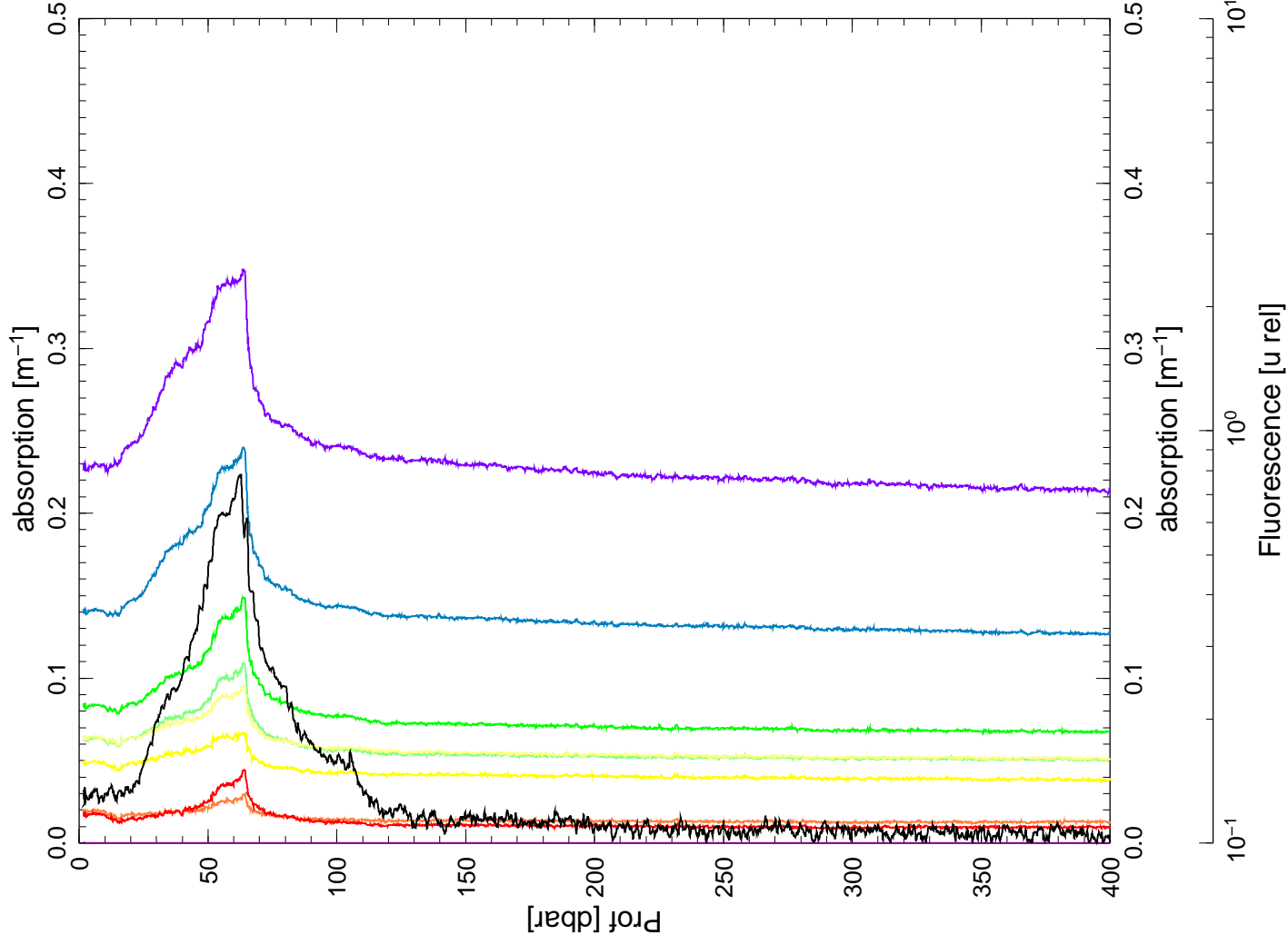


Corrections TS et diffusion : $a_\lambda = a_\lambda - a_{715}$

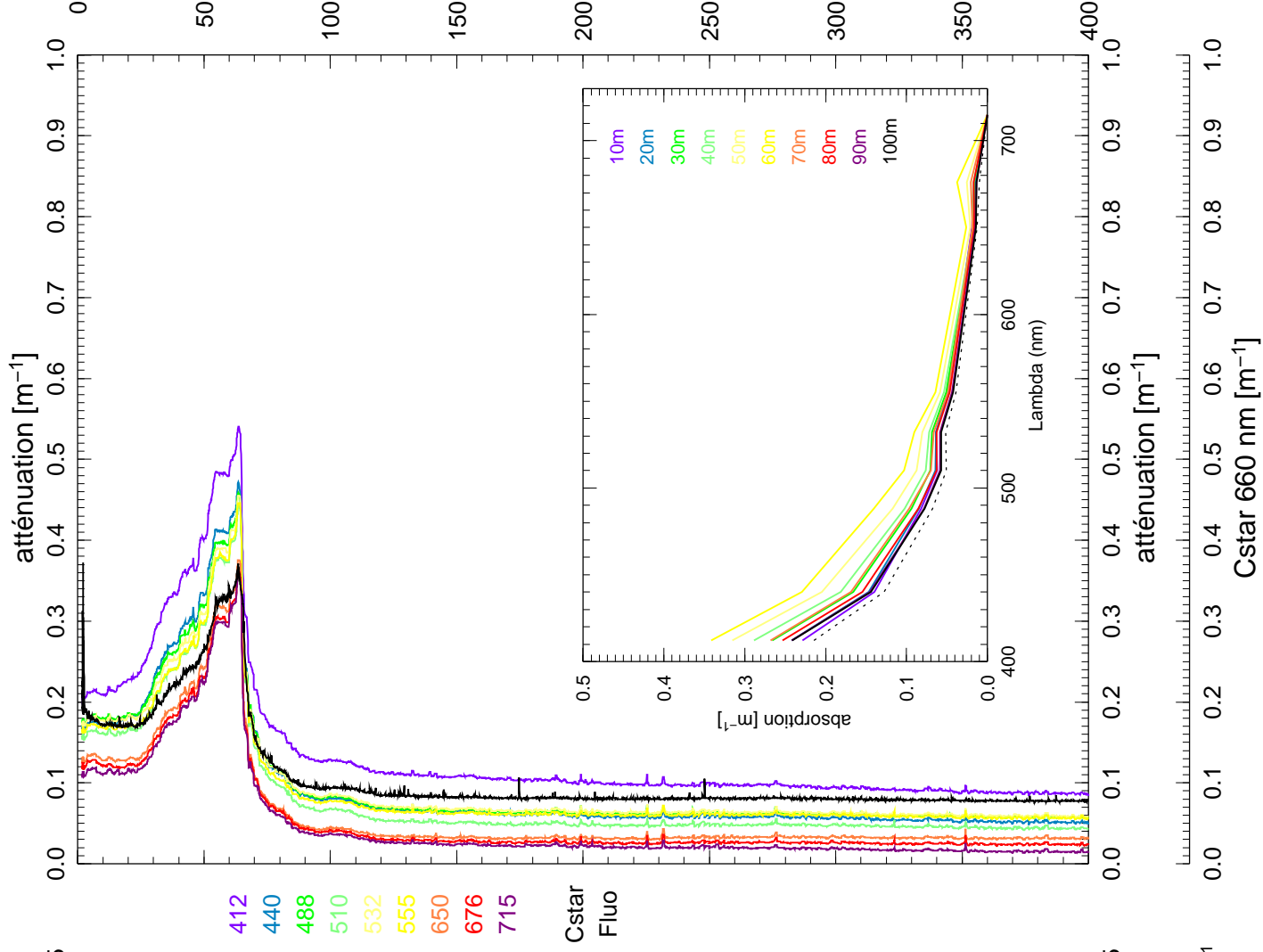




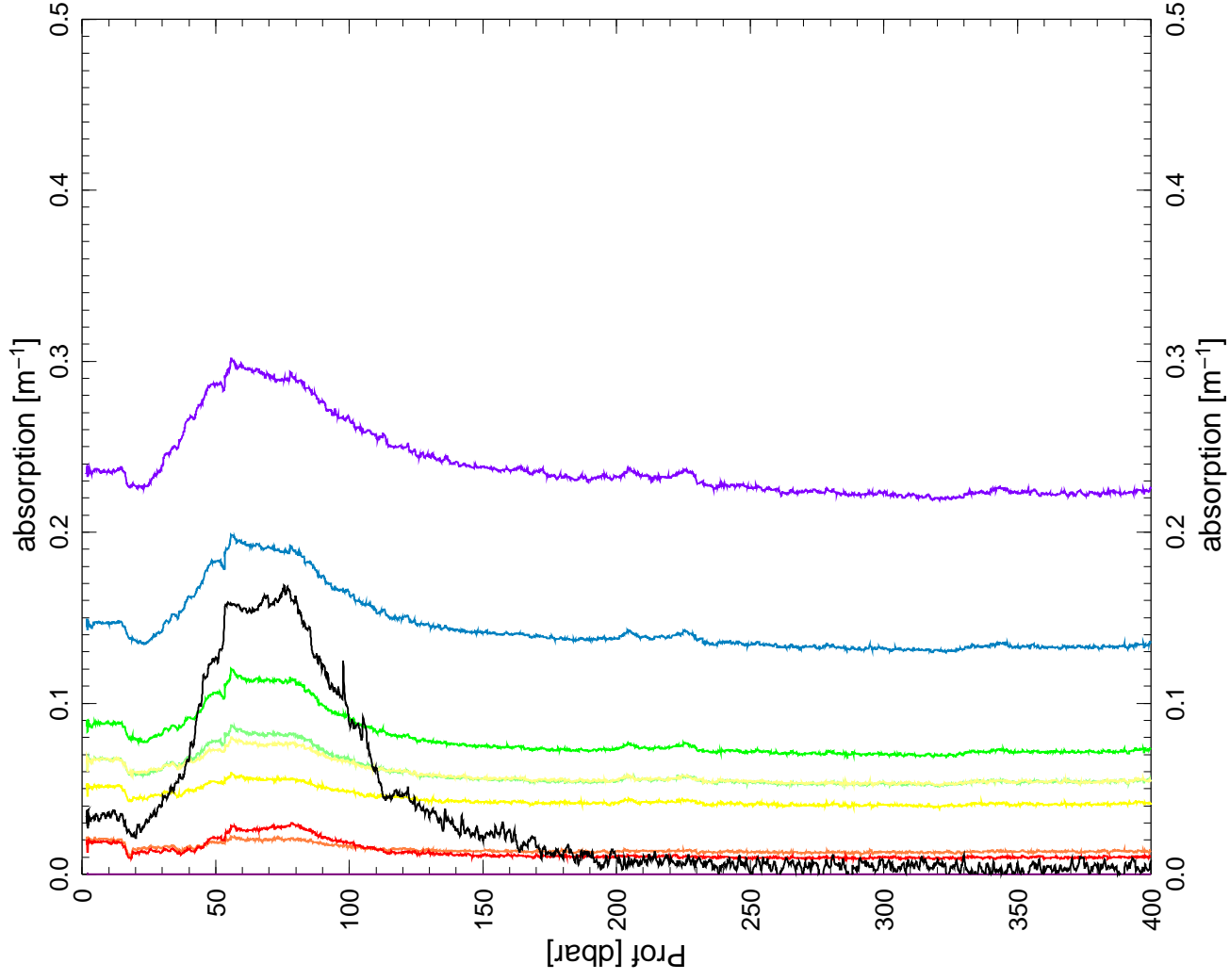
Boussole 55 Jul 09 2006 ac9009 bous009



Corrections TS et diffusion : $a_\lambda = a_\lambda - a_{715}$

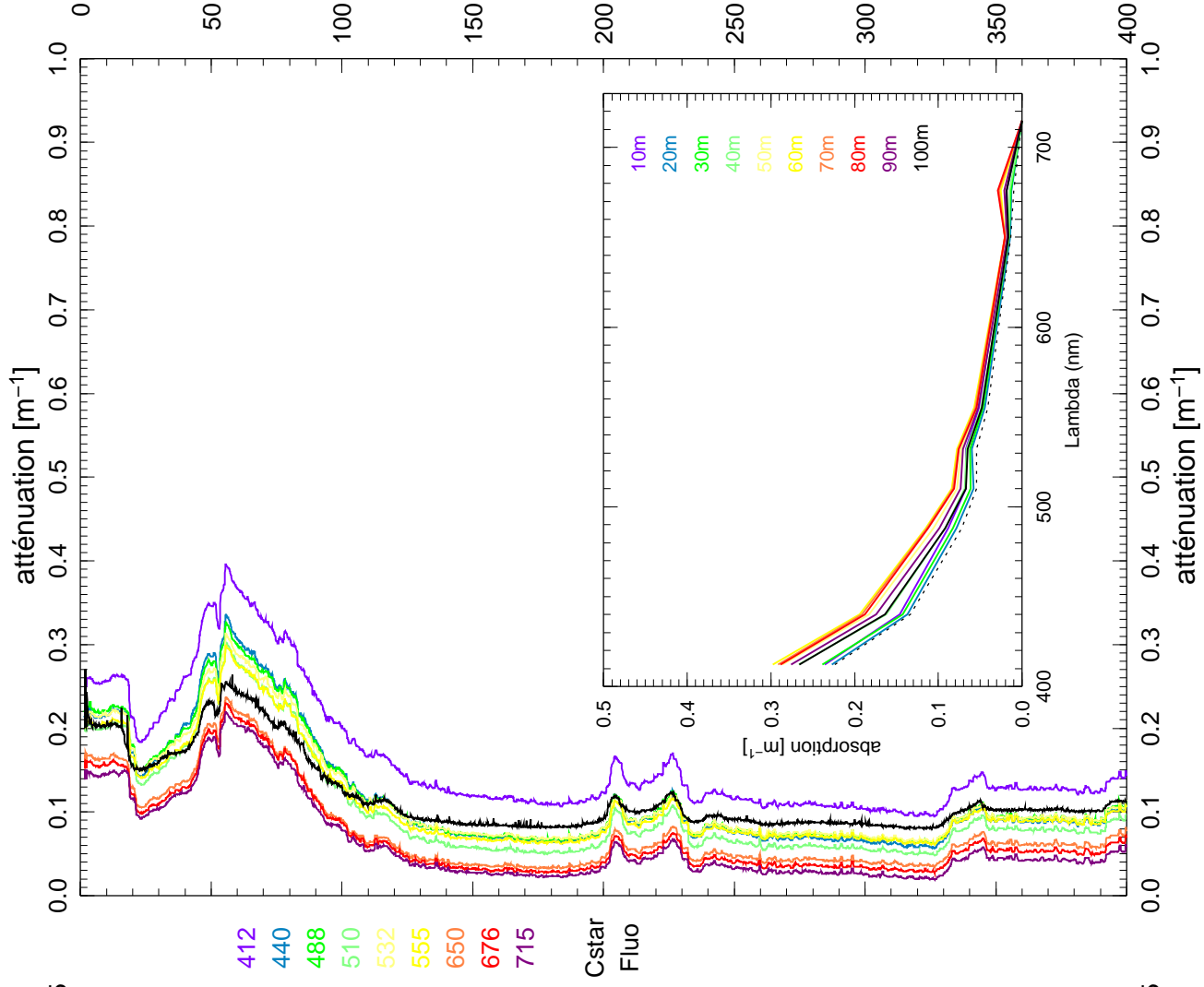


Boussole 55 Jul 09 2006 ac9010 bous010



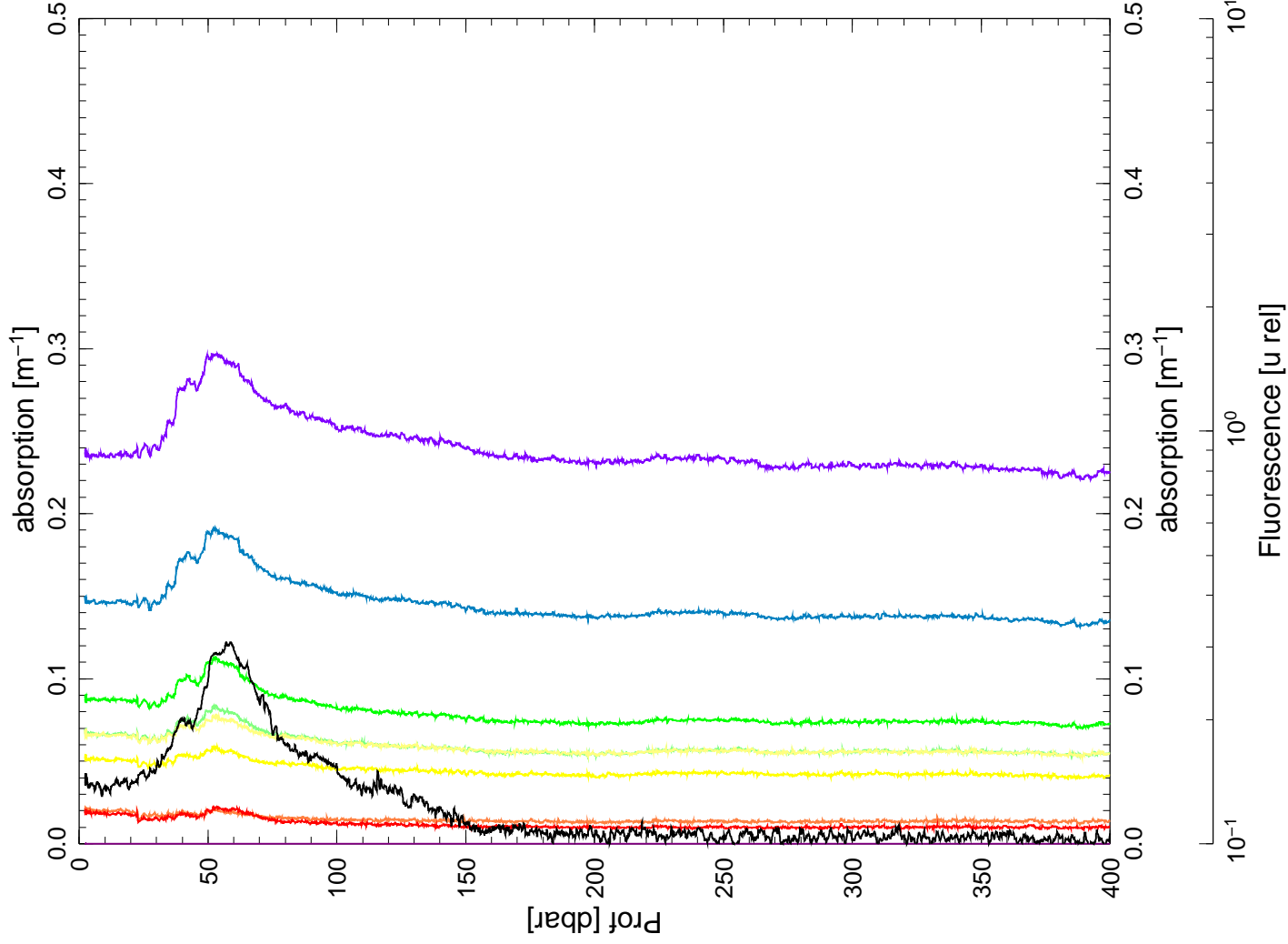
Fluorescence [u rel]
10⁻¹ 10⁰ 10¹

Corrections TS et diffusion : $a_\lambda = a_\lambda - a_{715}$

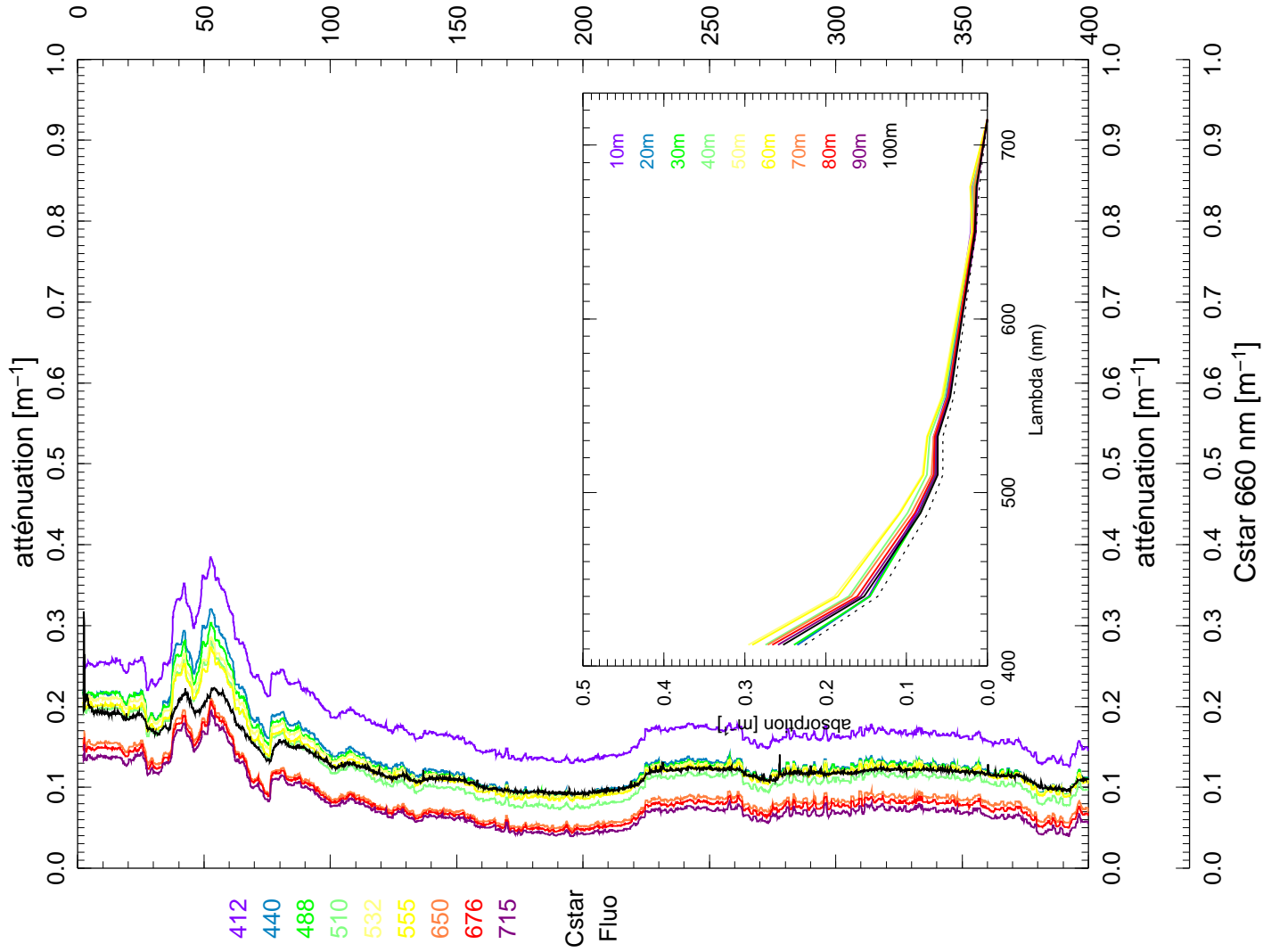


atténuation [m⁻¹]
0 50 100 150 200 250 300 350 400
atténuation [m⁻¹]
Cstar 660 nm [m⁻¹]

Boussole 55 Jul 09 2006 ac9011 bous011



Corrections TS et diffusion : $a_\lambda = a_\lambda - a_{715}$



Fluorescence [u rel]

10⁻¹ 10⁰ 10¹