Universidad de Concepción

DATA REPORT
SERIES DE TIEMPO OCEANOGRAFICAS

FIORDO AYSÉN
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Por

Winston Rojas
Oscar Pizarro
Cesar Hormazabal
Manuel Castillos
Ursula Cifuentes
Nadin Ramirez
Susana Giglio

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Mediciones Eulerianas (ADCP)

Las mediciones de corrientes en el fiordo de Aysén se realizaron con 4 ADCP (marca RDI Instruments de 75, 300 y 600 kHz) distribuidos en tres anclajes ubicados cercanas a la desembocadura de los rios Condor y Cuervo, y Caleta Gato (Fig. 1 y Tabla 1). El instrumento anclado en Condor no registró datos, por lo que se hará referencia solo a los instrumentos anclados en Cuervo y Gato.

Cada uno de los ADCP fueron configurados para medir a un intervalo de tiempo de 20 minutos y un espesor de capa determinado, el que varió entre 0.5 a 8 metros (Tabla A1, ANEXO 1). Estos datos fueron posteriormente convertidos a formato ASCII refiriendo las profundidades de cada celda a la superficie. Debido a la disposición y arquitectura de los transductores del ADCP (20º respecto a su eje) las mediciones de velocidad ubicadas a una distancia de la superficie equivalente al 6% de la profundidad del ADCP son consideradas no válidas. Otro criterio de selección de datos válidos por profundidad consideró el "porcentaje de datos buenos" (PG), el cual está basado en las sugerencias de control de calidad de los datos efectuadas por el fabricante del ADCP, los cuales involucran: baja correlación entre mediciones de cada transductor, alto error de la velocidad e interferencia por peces (ver ADCP, Principles of Operation a Practical Prime, RD Instruments).

Dado que para determinar la dirección de la corriente el ADCP utiliza un compás magnético (orientándola al norte magnético) todas las mediciones fueron corregidas por la desviación magnética del lugar (11.5º al Este del norte geográfico), de esta forma, los registros se orientan al norte geográfico o verdadero. Con las direcciones corregidas se calcularon las componentes este-oeste y norte-sur de la velocidad. Posteriormente se determinaron los ejes de máxima varianza (eje mayor) y su ortogonal (eje menor), entregándose como resultado diagramas de dispersión a distintas profundidades y calculando un ángulo de rotación para las distintas localidades (Tabla A1, ANEXO 1). Conociendo los ejes de máxima varianza, se procedió a rotar las componentes de la velocidad considerando la siguiente regla, la componente U es a lo largo fiordo donde las observaciones positivas indican que la corriente es hacia la boca del fiordo y la componente V es transversal al fiordo. A continuación, con las series de las componentes rotadas, se procedió a interpolar las brechas menores o iguales a 6 horas. Luego, con el fin de filtrar oscilaciones de alta frecuencia (menores a un día), se utilizó un filtro pasa-bajos coseno-Lanczos con poder medio de 60 horas.

Los diagramas de vectores progresivos (PVD) fueron construidos con datos crudos (sin rotar) e interpolados. Se construyeron figuras para las profundidades estándar de cada localidad y para toda la columna de agua.

Con el fin de describir la variabilidad de las corrientes en el dominio de la frecuencia, se utilizó análisis espectral rotatorio. Este análisis es más adecuado que el auto-espectro tradicional, especialmente cuando se trabaja con series vectoriales donde no existe una dirección físicamente predominante, para orientar un sistema de coordenadas. El análisis fue aplicado a los registros de corrientes de cada profundidad independientemente, utilizando la metodología de Mooers (1973; ver también Gonella, 1972). Esta técnica distribuye por frecuencias la varianza de las series vectoriales en una componente de giro con-reloj y otra anti-reloj o ciclónica y anticiclónica, respectivamente, para el hemisferio sur. Para dar confianza estadística a las estimaciones

espectrales, se dividió cada serie original en varios trozos del mismo tamaño, determinándose el espectro para cada trozo y promediándose las estimaciones espectrales dentro de una misma banda de frecuencia. Las series fueron divididas en 7 trozos las que corresponden a períodos de ~17, ~22 y ~33 días para las mediciones en Cuervo y Gato (WH300 kHz y LR75 kHz) respectivamente.

Además, se calcularon los principales constituyentes de marea para cada una de las profundidades medidas por los correntómetros. Para realizar estos cálculos se utilizó la metodología de Foreman (1993), usando el algoritmo implementado por Pawlowicz *et al.* (2002).

En la elaboración de las figuras se utilizaron las series rotadas e interpolados y en algunos casos (indicadas explícitamente en el pie de las figuras) las series filtradas. Una excepción a esta regla son los gráficos de dispersión y PVD, donde los datos están referidos al norte geográfico y sin filtrar.

Nivel del Mar

Con la finalidad de medir la variaciones del nivel del mar al interior del fiordo de Aysén, se ancló un sensor de presión en Caleta Gato y un oleomareógrafo (marca SeaBird modelo SBE26-03) en Punta Contreras localidad ubicada en la cabeza del fiordo (Fig. 1 y Tabla 2). La tasa de muestreo para el sensor de presión y oleomareógrafo fue de 20 minutos y 10 respectivamente. Los datos de nivel del mar no fueron corregidos por presión atmosférica.

En el análisis de la información de nivel del mar se calcularon los principales constituyentes de marea siguiendo la metodología de Foreman (1993), usando el algoritmo implementado por Pawlowicz *et al.* (2002).

Variables Meteorológicas

La estación meteorológica fue instalada en Puerto Chacabuco (Fig. 1 y Tabla 3). Entre otras variables éste equipo registra temperatura del aire, magnitud y dirección del viento, presión atmosférica y radiación solar. El gráfico fue confeccionado con promedios horarios. La estadística básica fue calculada utilizando la tasa original de muestreo de 10 minutos. Se debe considerar que en algunos períodos la tasa de muestreo fue de 15 minutos. La convención utilizada en la dirección es la oceanográfica (se sumo 180° a la dirección original).

Referencias

Acoustic Doppler Current Profiler, Principles of Operation a Practical Prime, 1996. RD Instruments. San Diego, California. 52 pp.

Foreman, M. 1993. Manual for tidal current analysis and prediction. Pacific Marine Science Report 78-2, Institute of Ocean Sciences, Patricia Bay, Victoria, B.C. Canada, 66 pp.

Gonella, J. 1972. A rotary component method for analysing meteorological and oceanographic vector time series. Deep Sea Res., 19, 833-846.

Mooers C. N. K., 1973. A technique for cross spectrum analysis of pairs of complex-valued time series, with emphasis on properties of polarized components and rotational invariants. Deep-Sea Research, 20. 1129-1141.

Pawlowicz, R., B. Beardsley, and S. Lentz, 2002. "Classical Tidal" Harmonic Analysis Including Error Estimates in MATLAB using T_TIDE", Computers and Geosciences.

Table 1. Location information and measurement period ADCPs.

Instrument	Location	Serial number	Date Deployment	Time (UTC)	Date Recovery	Time (UTC)	Latitude ºS	Longitude ºW	Depth (m)	Depth Instr. (m)
ADCP WH300 kHz	Condor	-	21/09/2009	21:20	-	-	45º26.620'	72º55.000'	184	37.0
ADCP WH600 kHz	Cuervo	6519	21/09/2009	17:20	*24/01/2010	*15:20	45º22.750'	73º04.350'	218	33.5
ADCP WH300 kHz	Gato	2999	20/09/2009	22:25	*19/02/2010	*15:00	45º16.165'	73º11.400'	307	31.1
ADCP LR75 kHz	Gato	-	20/09/2009	22:25	06/05/2010	14:05	45º16.165'	73º11.400'	307	307.0

(*) Date and hour last measurement.

Table 2. Location information and measurement period, tide gauge and pressure sensor.

Instrument	Location	Serial number	Date Deployment	Time (UTC)	Date Recovery	Time (UTC)	Latitude (ºS)	Longitude (ºW)	Depth. (m)	Depth. Instr. (m)
Tide Gauge	Punta Contreras	26186100209	25/09/2009	19:20	04/05/2010	20:50	45º24.520'	72º50.035'	-	~ 5.0
Pressure sensor	Caleta Gato	-	23/09/2009	16:15	06/05/2010	15:40	45º17.919'	73º11.928'	-	~ 7.5

Table 3. Location of the weather station

Instrument	Location	Serial number	Latitude (ºS)	Longitude (ºW)	Altitude Instr. (m)
Weather station	Puerto Chacabuco	-	45º27.832'	72º49.412'	-
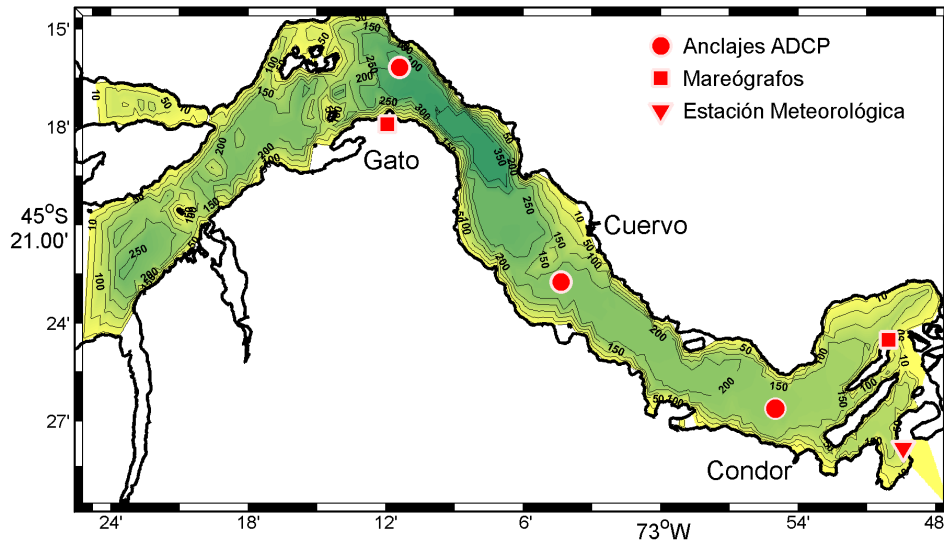
Figure 1. The study area and locations of the instruments anchored in fjord Aysén. The instruments are ADCPs (circles), pressure sensor and tide gauge (squares) and weather station (triangle).

I) MEDICIONES EULERIANAS (ADCP anclado)

Cuervo

1) ADCP WH 600 Khz
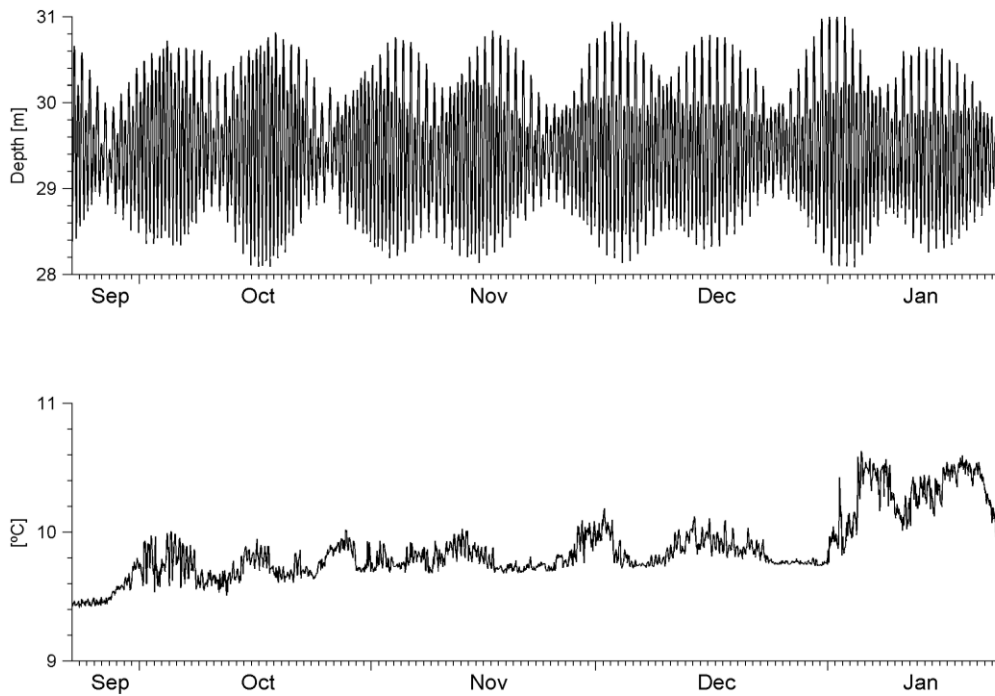
Figure 1.1. Hourly time series of depth and temperature records from the ADCP. Location Cuervo.
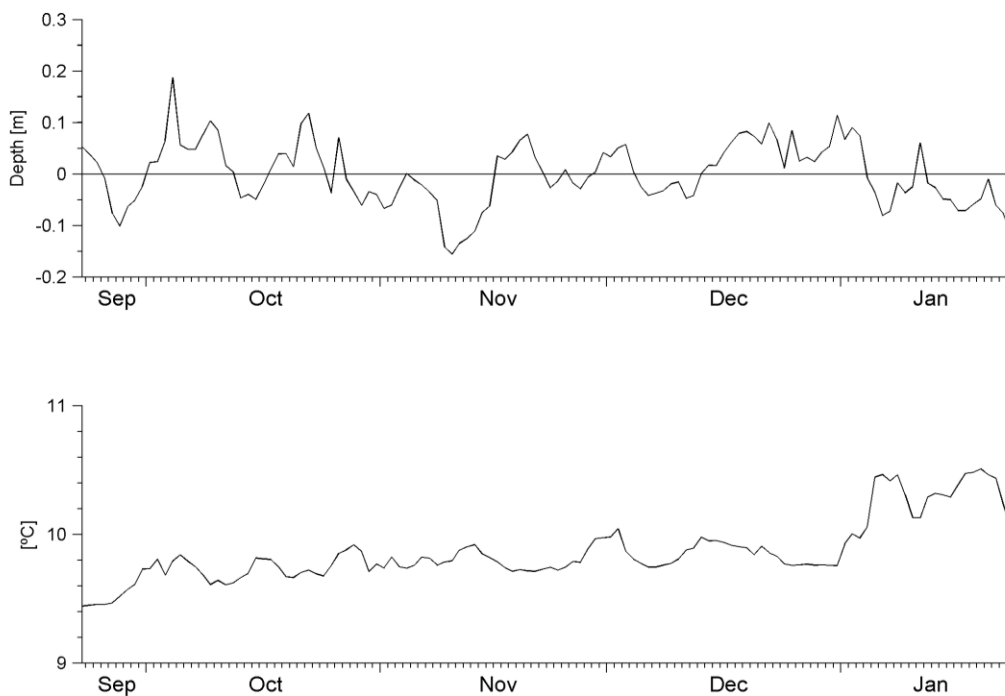
Figure 1.2. Daily time series of depth and temperature records from the ADCP. Location Cuervo.
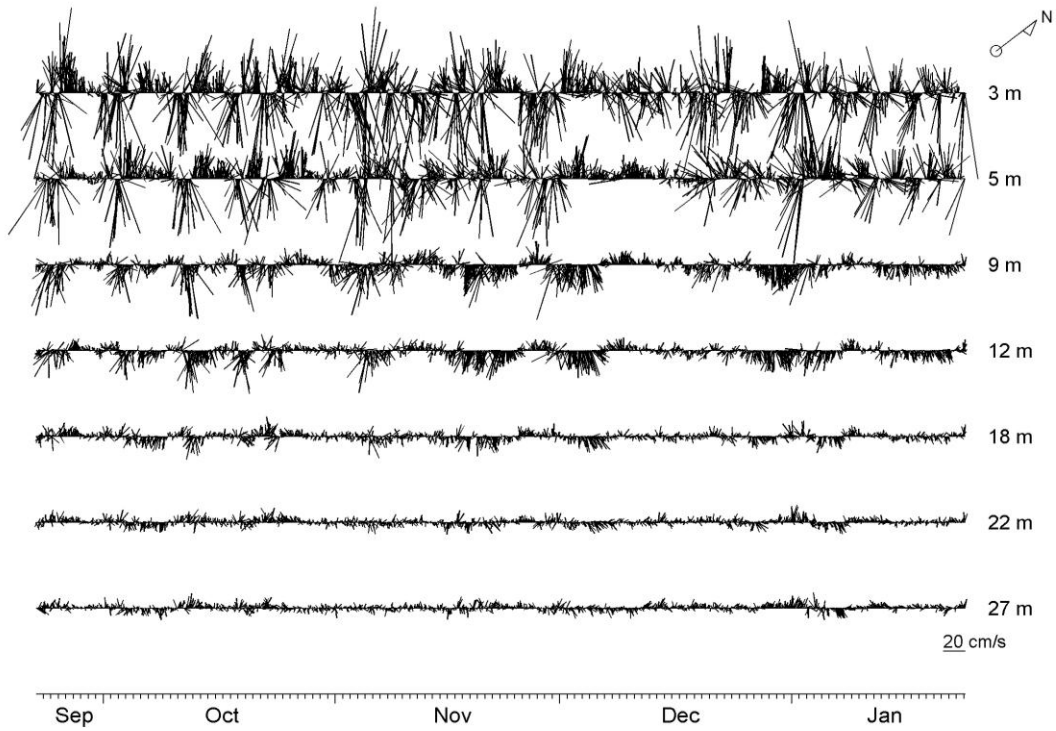
Figure 1.3. Current vectors at Cuervo. The data was re-sampled each two hours.
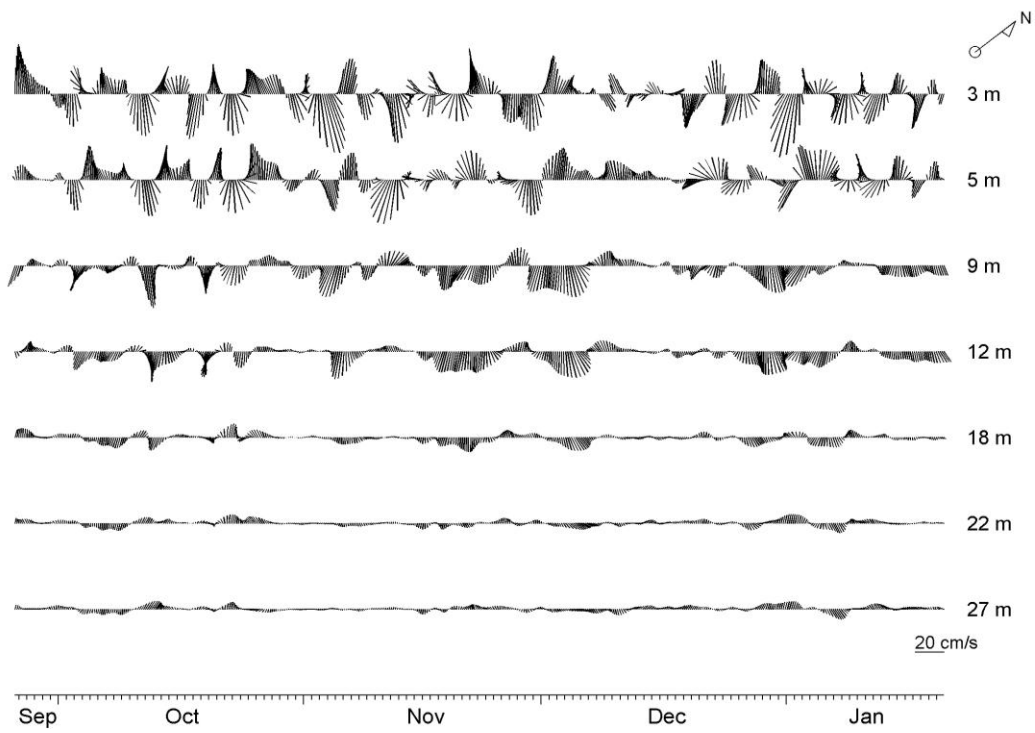
Figure 1.4. Current vectors. Filtered data and re-sampled each six hours. Location Cuervo.
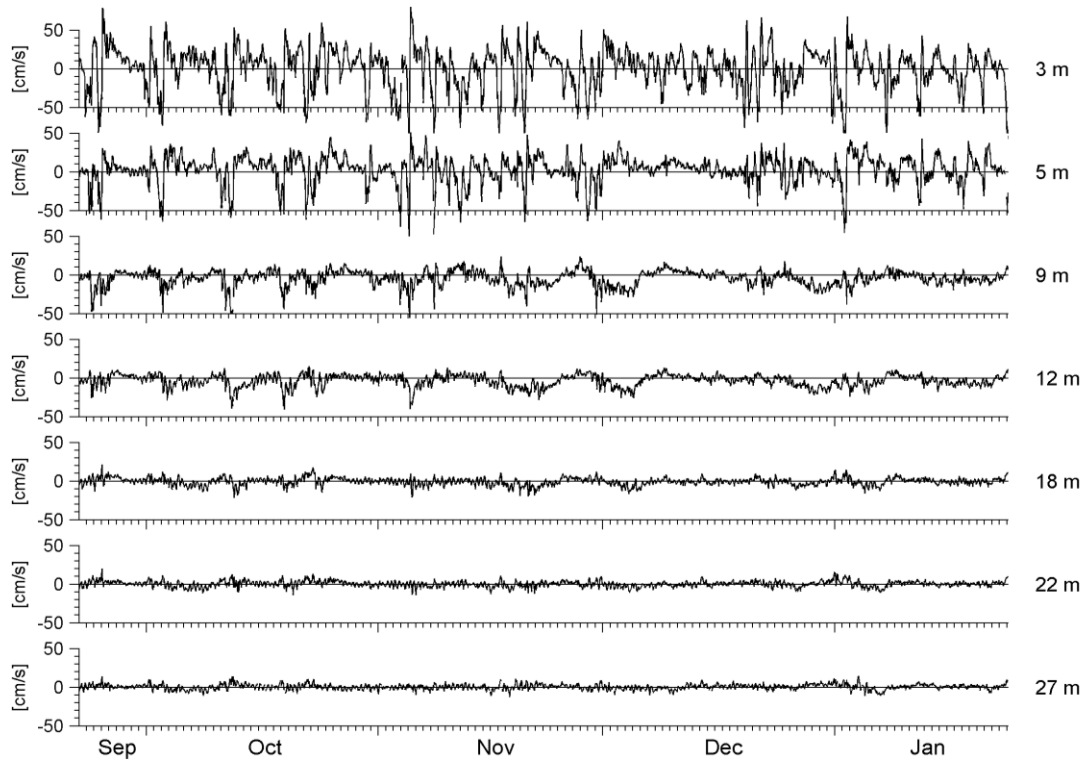
Figure 1.5. Hourly time series of the along fjord velocity (U-component) at Cuervo.
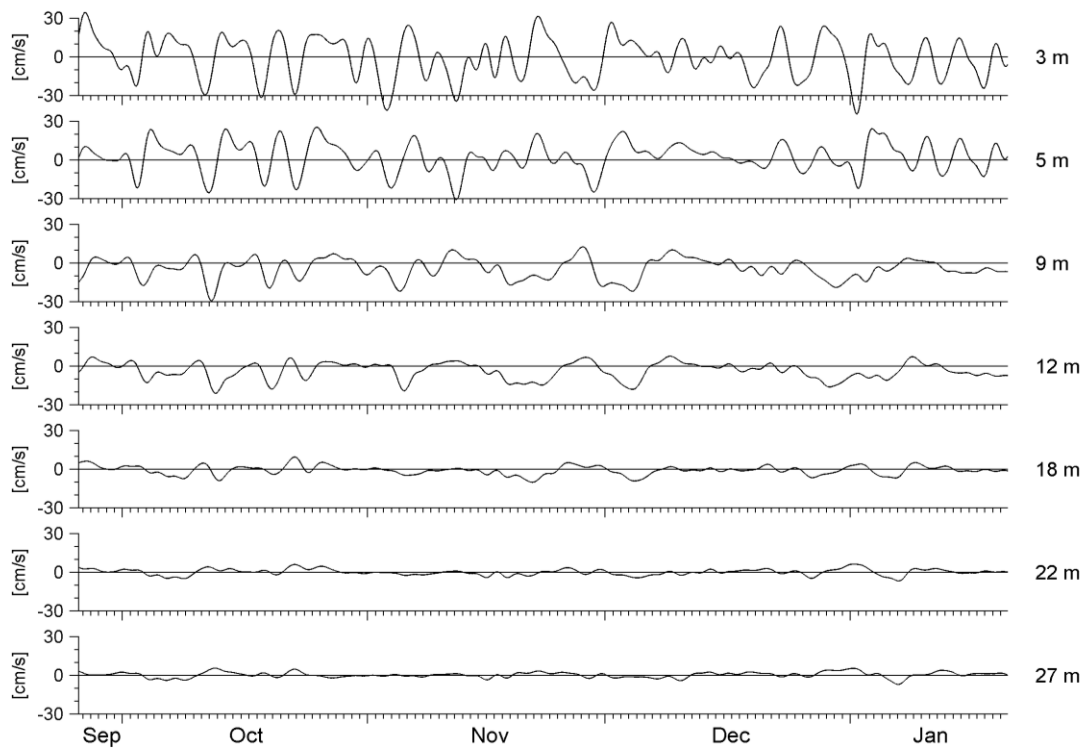
Figure 1.6.. Low-passed time series of the along fjord velocity (U-component) at Cuervo
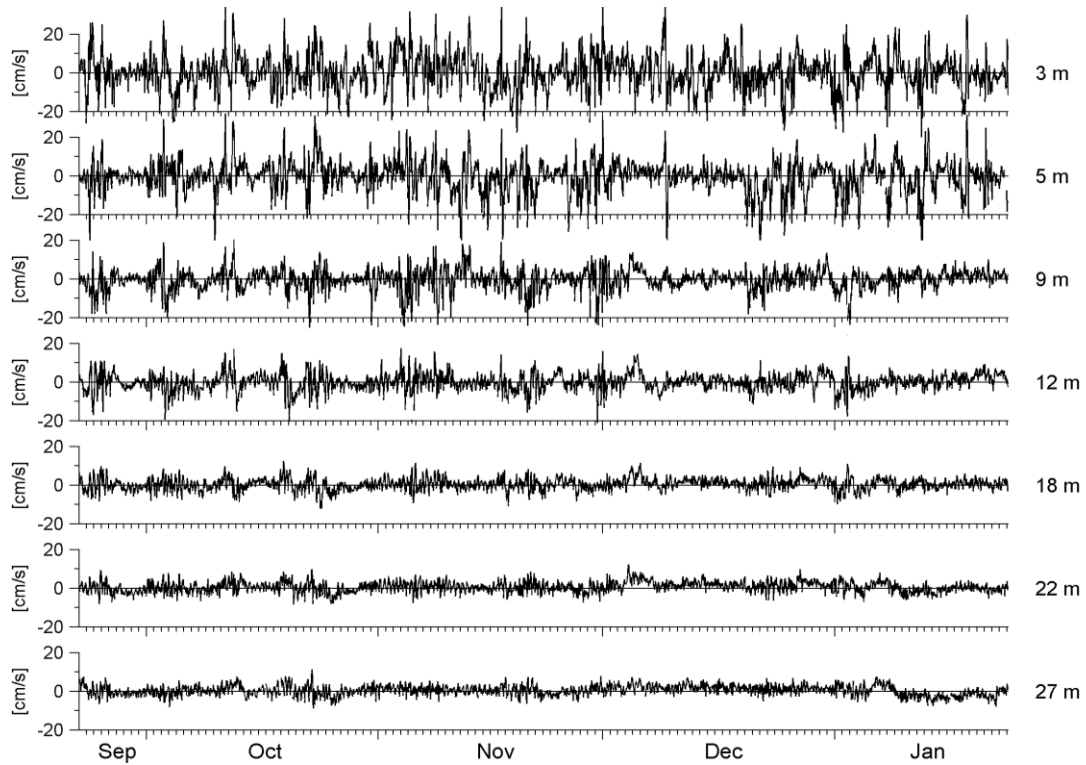
Figure 1.7. Hourly time series of the cross fjord velocity (V-component) at Cuervo.
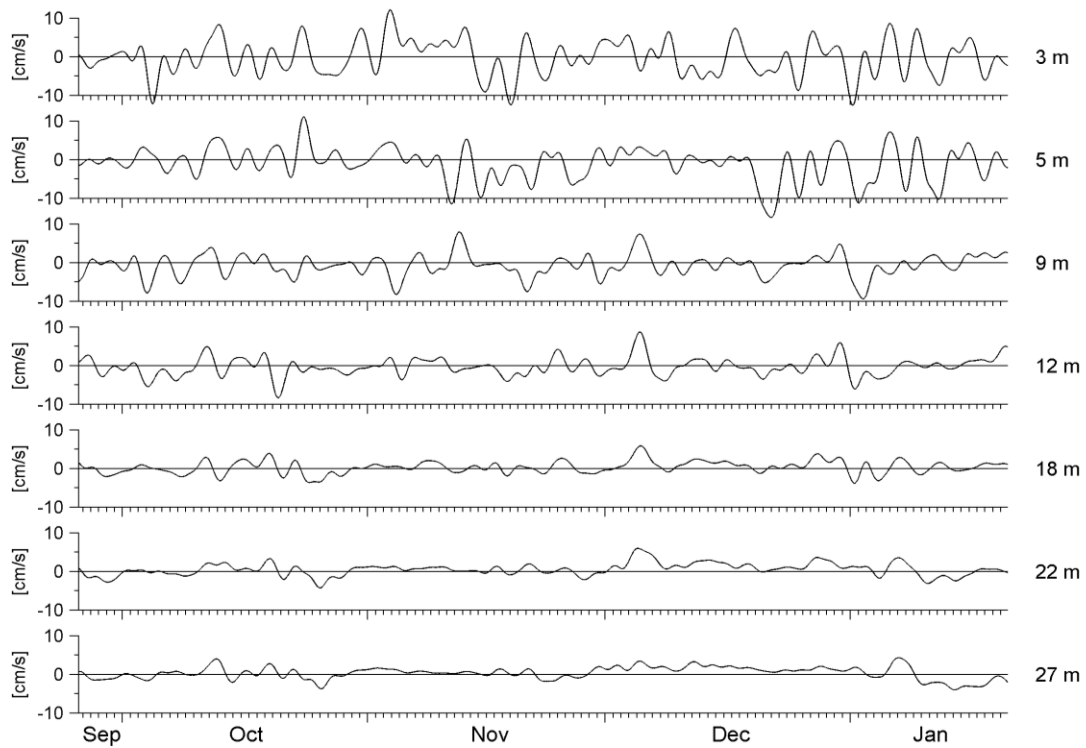
Figure 1.8. Low-passed time series of the cross fjord velocity (V-component) at Cuervo.
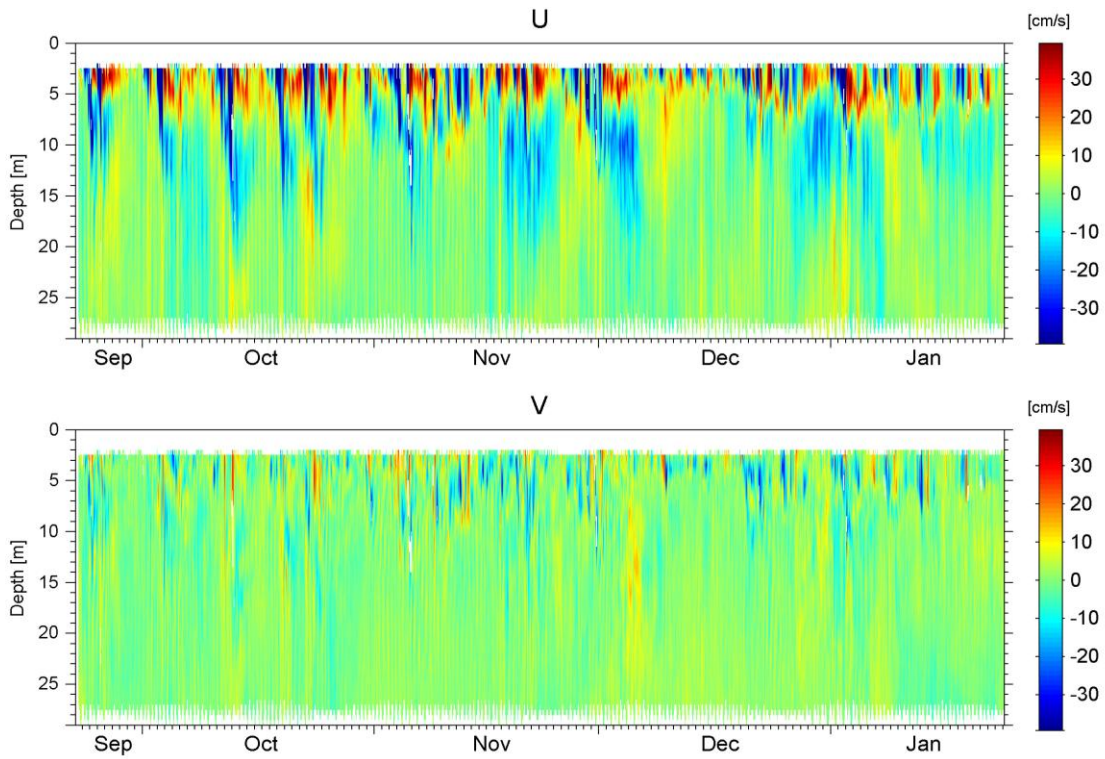
Figure 1.9. U (along fjord) and V(cross fjord) Components of the velocity. Low-passed data at Cuervo.
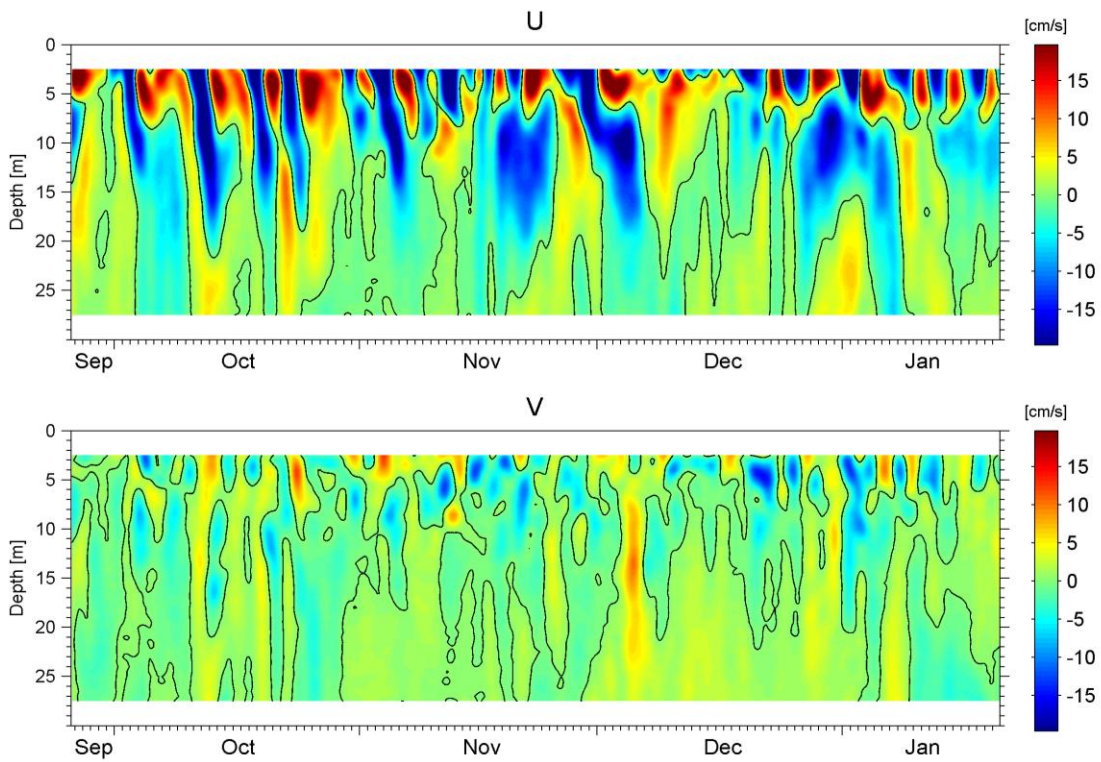
Figure 1.10. U (along fjord) and V(cross fjord) Components of the current. Low-passed data at Cuervo.
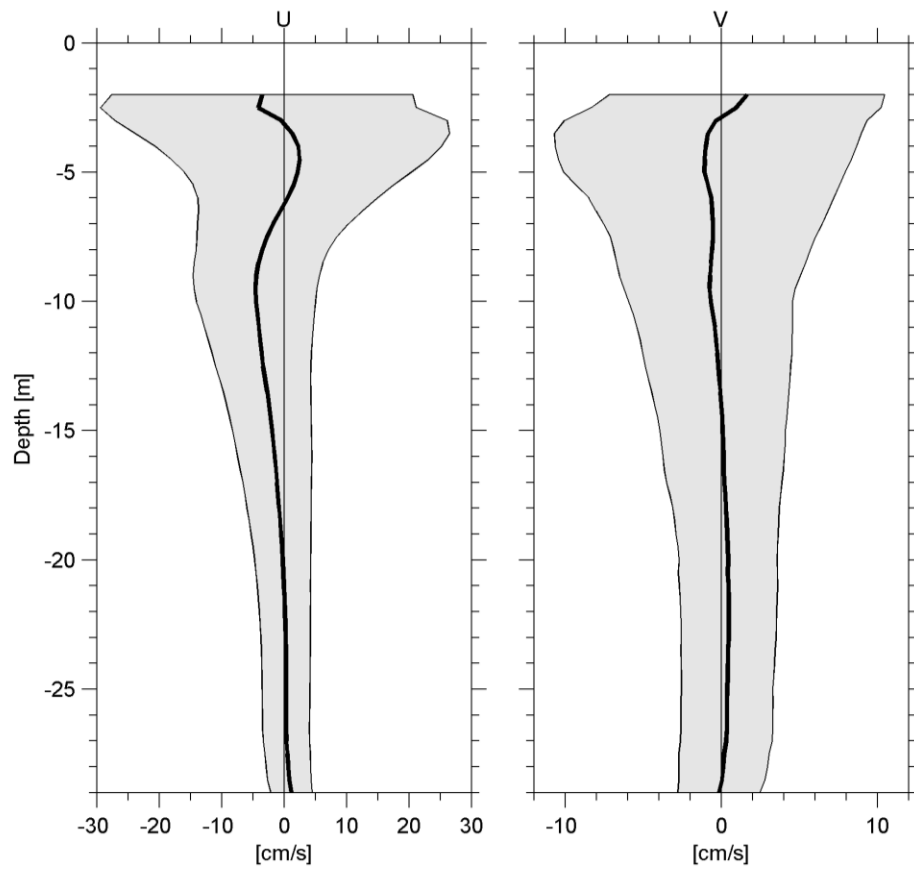
Figure 1.11. **A**verage profile of the along (U) and cross (V) fjord components. Location Cuervo.
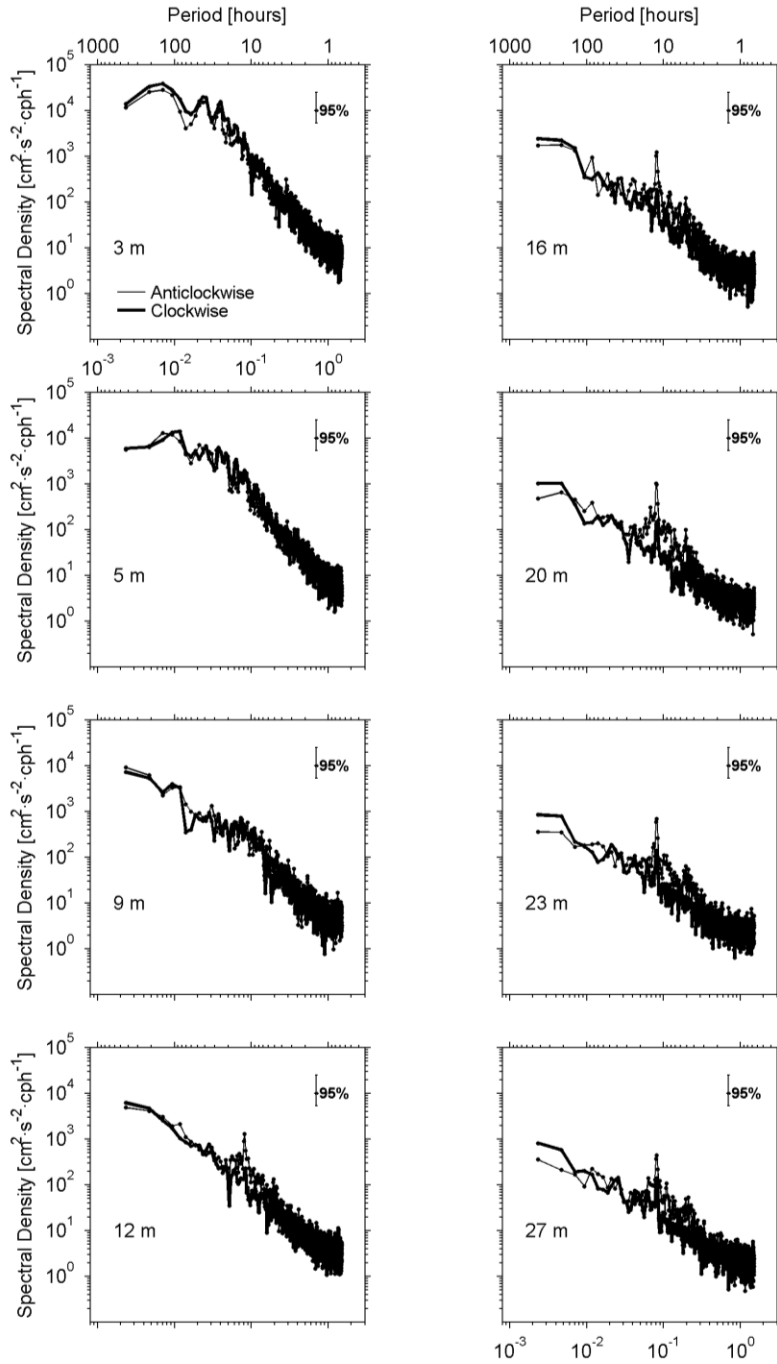
Figure 1.12. Clockwise and anticlockwise spectra of kinetic energy density. Spectra were estimated using 14 degrees of freedom (based on ~17 day-long segments). Location Cuervo.
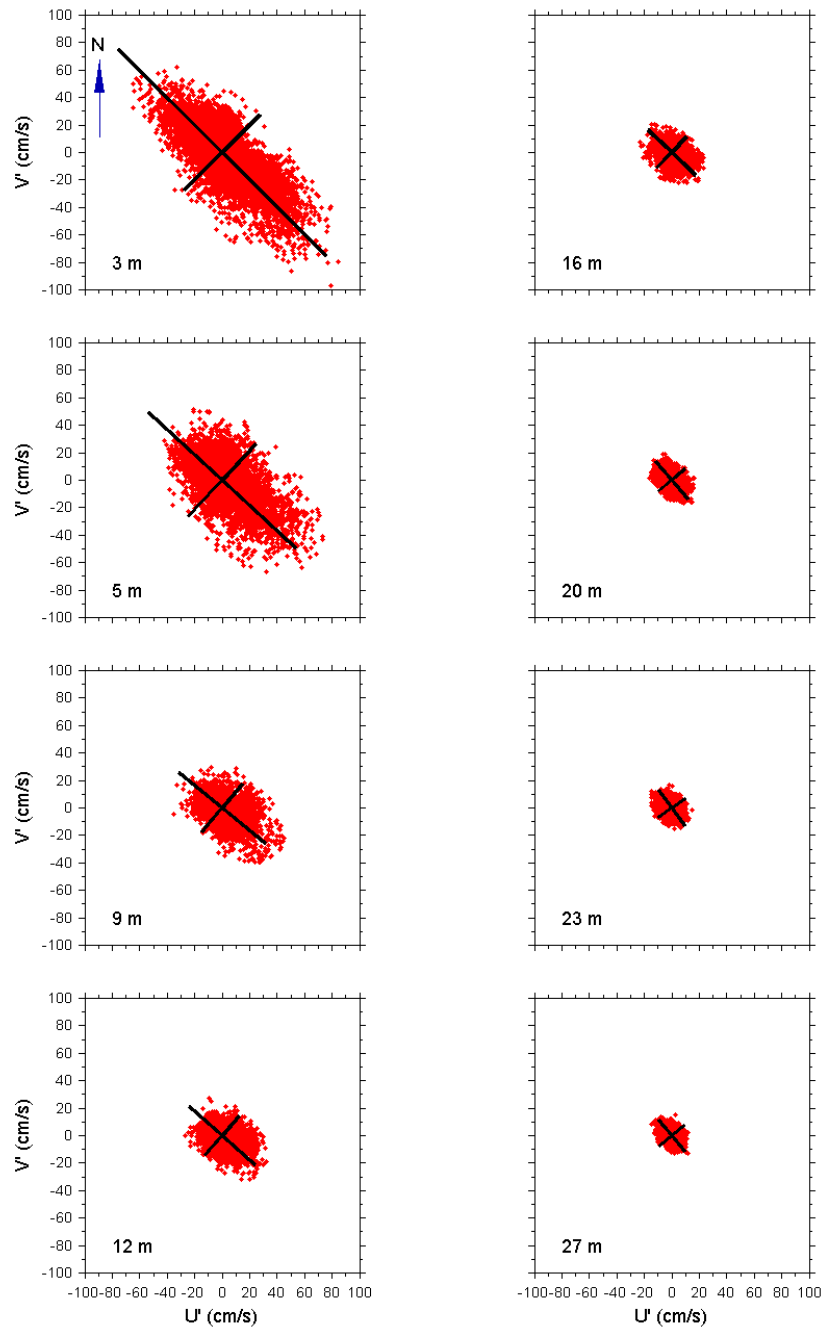
Figure 1.13. Scatter diagrams and principals axes. Arrow direction indicate North. The longitudes of axes are 4 standard deviations. Location Cuervo.
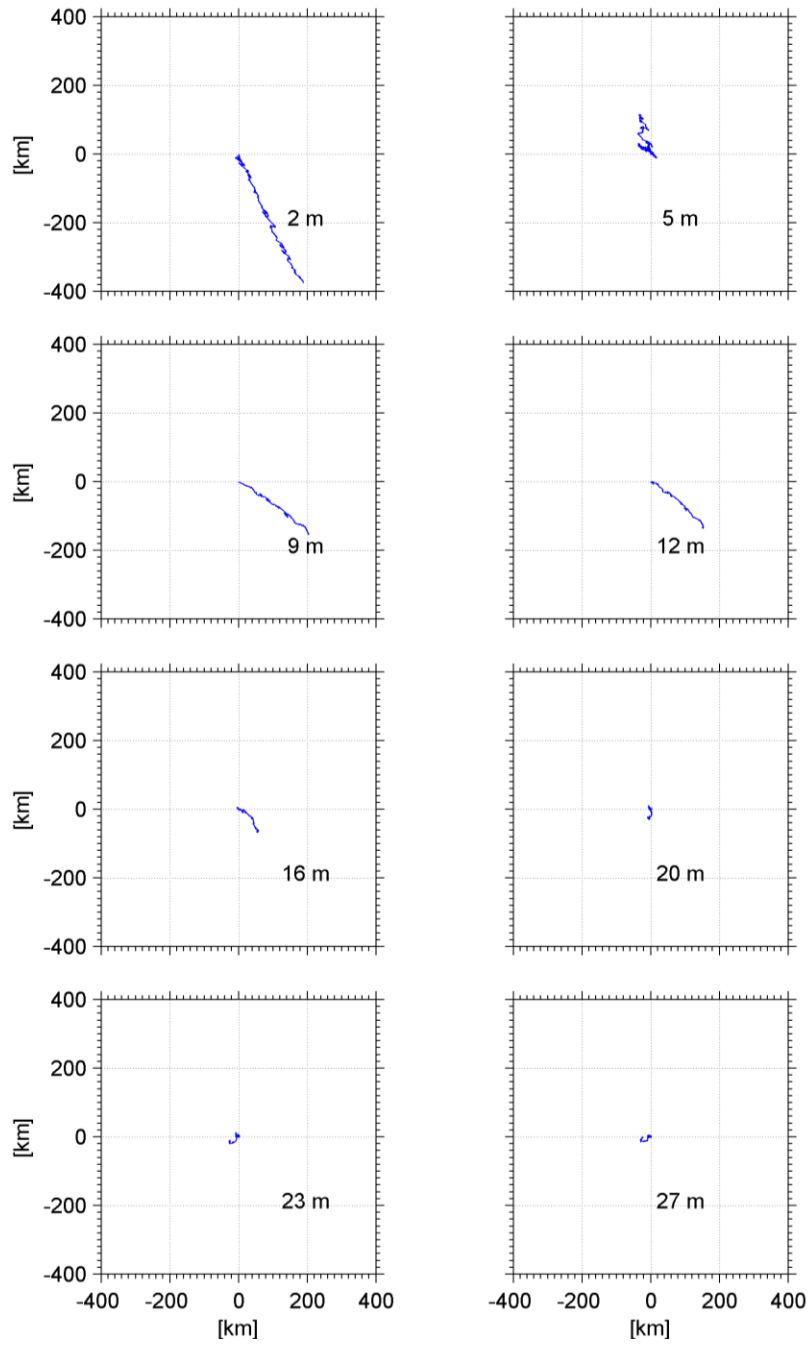
Figure 1.14. Progressive vector diagrams. Axes no rotated. Location Cuervo.
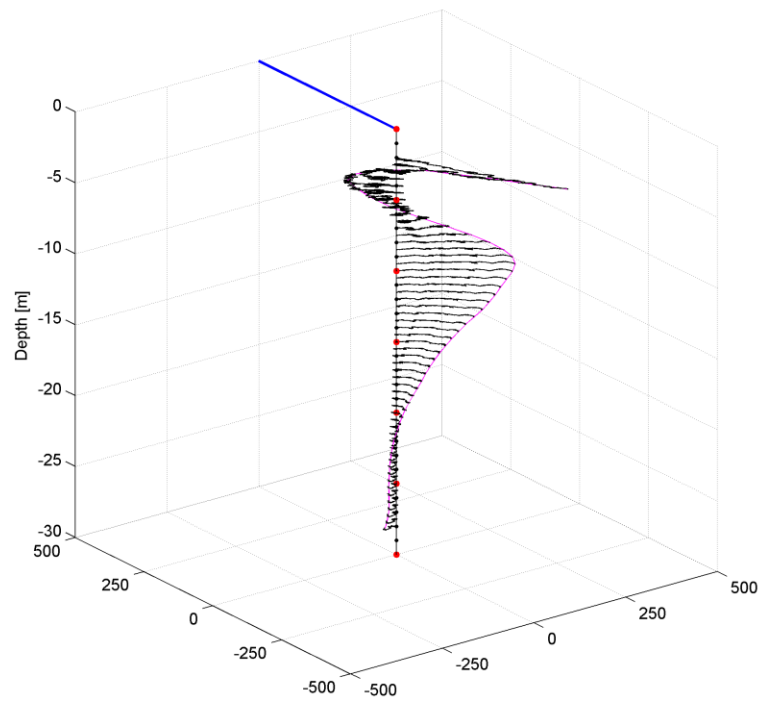
Figure 1.15. Progressive vector diagrams all depth. The line blue indicate to north. The axes were no rotated. Location Cuervo.

Table 1.1. Statistics of the current records at Cuervo. $\overline{|v|}$, $|v|_{max}$, $|v|_{std}$, $\overline{u}$, u', $\overline{v}$, v', $u'v'$, K_e and N are magnitude mean, magnitude maximum, standard deviation of magnitude, average, standard deviation and covariance of components u and v, kinetics energy and number of data.

| Depth (m)	$\overline{|v|}$ (cm/s)	$|v|_{max}$ (cm/s)	$|v|_{std}$ (cm/s)	$\overline{u}$ (cm/s)	u' (cm/s)	$\overline{v}$ (cm/s)	v' (cm/s)	$u'v'$ (cm²/s²)	K_e (cm²/s²)	N
2.0	20.26	106.57	16.26	-3.52	24.12	1.64	8.82	12.09	329.77	3081
2.5	21.53	125.65	16.78	-4.15	25.32	0.95	9.27	8.18	363.49	8598
3.0	22.97	125.62	16.55	-0.48	26.60	-0.36	9.69	12.58	400.74	8595
3.5	22.14	116.55	15.62	1.30	25.20	-0.87	9.83	22.22	365.78	8774
4.0	20.24	104.46	14.63	2.26	22.90	-0.99	9.65	28.45	308.70	8862
4.5	18.20	100.97	13.73	2.46	20.60	-1.06	9.39	23.56	256.28	8883
5.0	16.00	85.04	12.67	2.16	18.16	-1.08	9.01	14.33	205.39	8849
5.5	13.99	79.18	11.62	1.47	16.02	-0.87	8.44	5.67	163.85	8842
6.0	12.52	72.25	10.56	0.53	14.35	-0.64	7.84	0.85	133.75	8847
6.5	11.53	68.04	9.72	-0.64	13.10	-0.60	7.42	1.88	113.33	8888
7.0	10.80	64.36	9.05	-1.82	12.09	-0.54	6.99	2.77	97.51	8896
7.5	10.27	60.34	8.42	-2.79	11.19	-0.54	6.57	3.16	84.19	8896
8.0	9.98	56.81	8.05	-3.52	10.59	-0.59	6.29	4.11	75.87	8909
8.5	9.92	57.47	7.89	-4.13	10.32	-0.65	6.06	6.66	71.65	8919
9.0	9.84	56.40	7.73	-4.48	10.11	-0.72	5.80	8.36	67.92	8942
9.5	9.65	53.82	7.46	-4.60	9.84	-0.76	5.48	8.41	63.46	8939
10.0	9.37	50.77	7.17	-4.51	9.53	-0.68	5.25	7.63	59.18	8952
10.5	9.04	48.23	6.73	-4.27	9.08	-0.55	5.10	6.80	54.20	8956
11.0	8.72	47.99	6.41	-4.06	8.70	-0.43	4.98	6.27	50.26	8960
11.5	8.41	43.86	6.07	-3.84	8.31	-0.34	4.86	4.60	46.32	8957
12.0	8.13	41.80	5.78	-3.61	7.97	-0.26	4.79	3.53	43.19	8963
12.5	7.83	40.82	5.52	-3.38	7.65	-0.22	4.65	2.70	40.12	8969
13.0	7.49	38.50	5.23	-3.06	7.31	-0.14	4.54	1.59	36.98	8971
13.5	7.17	36.86	4.95	-2.74	7.00	-0.06	4.39	0.82	34.16	8971
14.0	6.89	34.27	4.75	-2.47	6.77	-0.01	4.27	0.64	32.01	8977
14.5	6.61	34.07	4.56	-2.20	6.53	0.06	4.13	0.38	29.83	8978
15.0	6.38	30.76	4.38	-1.96	6.31	0.07	4.02	0.78	27.99	8982
15.5	6.19	31.59	4.23	-1.72	6.13	0.13	3.96	1.01	26.62	8986
16.0	6.01	29.89	4.09	-1.52	5.95	0.14	3.89	0.94	25.25	8986
16.5	5.83	27.39	3.89	-1.32	5.73	0.16	3.81	0.65	23.67	8980
17.0	5.60	28.58	3.70	-1.13	5.49	0.19	3.69	0.15	21.87	8975
17.5	5.41	26.54	3.51	-0.99	5.30	0.25	3.54	-0.03	20.30	8980
18.0	5.23	23.96	3.39	-0.83	5.14	0.30	3.41	-0.30	19.02	8984
18.5	5.07	24.89	3.26	-0.66	4.96	0.34	3.34	-0.52	17.88	8984
19.0	4.92	23.28	3.14	-0.50	4.79	0.37	3.28	-0.61	16.85	8984
19.5	4.77	23.11	3.02	-0.36	4.63	0.40	3.18	-0.68	15.80	8988
20.0	4.66	21.92	2.89	-0.24	4.47	0.44	3.14	-0.70	14.94	8985
20.5	4.61	19.86	2.83	-0.15	4.36	0.42	3.18	-0.80	14.55	8987
21.0	4.55	18.79	2.74	-0.06	4.26	0.46	3.15	-0.83	14.01	8986
21.5	4.49	20.88	2.68	0.06	4.18	0.47	3.11	-0.94	13.58	8987
22.0	4.44	20.29	2.59	0.12	4.09	0.47	3.08	-0.91	13.11	8987
22.5	4.39	17.23	2.52	0.17	4.01	0.48	3.05	-0.95	12.69	8985
23.0	4.37	19.59	2.48	0.22	3.97	0.47	3.04	-0.96	12.49	8988
23.5	4.34	17.45	2.44	0.27	3.92	0.43	3.02	-1.01	12.26	8989
24.0	4.29	19.37	2.41	0.27	3.87	0.41	3.00	-0.83	11.98	8990
24.5	4.26	17.63	2.38	0.29	3.84	0.40	2.96	-0.85	11.77	8987
25.0	4.20	17.68	2.37	0.30	3.81	0.37	2.93	-0.71	11.53	8987
25.5	4.20	19.27	2.41	0.30	3.81	0.36	2.94	-0.72	11.60	8991

Continuation Table 1.1

Depth (m)	$\overline{|v|}$ (cm/s)	$|v|_{max}$ (cm/s)	$|v|_{std}$ (cm/s)	$\overline{u}$ (cm/s)	u' (cm/s)	$\overline{v}$ (cm/s)	v' (cm/s)	u' v' (cm²/s²)	K_e (cm²/s²)	N
26.0	4.17	17.77	2.39	0.30	3.77	0.36	2.93	-0.59	11.42	8990
26.5	4.14	18.01	2.39	0.29	3.75	0.35	2.94	-0.58	11.35	8991
27.0	4.12	17.53	2.39	0.36	3.71	0.31	2.94	-0.44	11.22	8683
27.5	4.05	18.19	2.34	0.53	3.63	0.17	2.89	-0.20	10.79	6867
28.0	3.99	17.21	2.29	0.66	3.56	0.12	2.84	-0.19	10.38	4621
28.5	3.96	17.40	2.22	0.81	3.51	0.04	2.76	-0.08	9.96	2423
29.0	3.89	11.80	2.03	1.15	3.31	-0.16	2.64	0.81	8.94	741

Table 1.2. Constituents of the tidal currents at Cuervo (3 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	1.82	4.39	1.14	2.41	140.71	47.17	15.72	142.08	0.17
*MSF	0.0028	1.87	3.83	0.33	1.78	3.41	30.10	136.67	150.30	0.24
*ALP1	0.0344	2.37	3.08	-0.41	1.37	173.06	28.63	263.70	106.19	0.59
*2Q1	0.0357	0.70	2.74	0.50	1.54	45.19	40.07	132.36	200.86	0.06
*Q1	0.0372	3.31	4.21	-0.03	1.29	5.45	21.13	166.74	69.86	0.62
*O1	0.0387	2.50	3.62	-0.35	1.50	169.79	29.98	102.61	103.72	0.48
*NO1	0.0403	1.78	2.79	-0.24	1.16	162.77	32.35	26.00	114.68	0.40
*K1	0.0418	3.67	4.16	-0.77	1.38	7.52	25.07	132.58	70.70	0.78
*J1	0.0433	1.20	2.76	0.23	1.63	130.77	49.44	167.37	181.89	0.19
*OO1	0.0448	1.10	2.18	-0.23	1.11	24.52	37.58	136.59	156.58	0.26
*UPS1	0.0463	2.33	3.12	-0.30	1.24	6.39	24.59	242.41	86.72	0.56
*EPS2	0.0762	1.07	1.39	0.03	0.90	177.27	49.98	331.58	113.37	0.60
*MU2	0.0777	1.04	1.29	-0.25	1.11	55.92	82.91	57.87	76.25	0.65
*N2	0.0790	1.39	1.51	-0.02	1.11	155.65	50.33	228.98	70.46	0.85
*M2	0.0805	2.81	1.92	0.22	1.01	4.15	22.59	84.82	36.28	2.14
*L2	0.0820	0.84	1.25	-0.21	0.99	32.15	58.71	128.25	122.07	0.46
*S2	0.0833	2.17	1.58	0.22	0.88	178.26	26.24	296.69	55.78	1.89
*ETA2	0.0851	0.45	1.03	0.09	0.86	126.03	82.29	130.99	178.18	0.19
*MO3	0.1192	0.34	0.62	-0.11	0.51	134.66	75.19	93.07	123.21	0.31
*M3	0.1208	0.67	0.79	-0.10	0.60	154.38	58.13	284.52	81.35	0.72
*MK3	0.1223	0.51	0.68	0.07	0.63	28.06	58.46	274.98	106.20	0.56
*SK3	0.1251	0.16	0.55	-0.11	0.44	10.35	73.31	322.67	200.57	0.09
*MN4	0.1595	0.53	0.67	-0.19	0.56	31.38	69.26	22.59	96.64	0.62
*M4	0.1610	0.25	0.53	-0.08	0.55	93.28	171.53	267.17	181.22	0.22
*SN4	0.1623	0.74	0.79	-0.19	0.51	5.94	49.79	71.53	72.10	0.87
*MS4	0.1638	0.45	0.66	0.15	0.55	129.42	97.96	306.24	107.51	0.47
*S4	0.1667	0.24	0.58	0.09	0.51	61.59	114.59	271.76	183.70	0.16
*2MK5	0.2028	0.17	0.35	0.14	0.34	134.58	97.91	187.74	166.65	0.24
*2SK5	0.2084	0.28	0.40	-0.15	0.39	95.02	145.28	113.26	105.91	0.51
*2MN6	0.2400	0.19	0.27	0.04	0.27	169.09	100.48	352.47	121.78	0.48
*M6	0.2415	0.28	0.34	0.08	0.33	20.27	84.39	5.70	94.58	0.68
*2MS6	0.2444	0.25	0.33	-0.13	0.30	12.65	91.71	83.49	122.12	0.55
*2SM6	0.2472	0.28	0.29	0.04	0.35	70.81	100.01	305.58	84.91	0.92
*3MK7	0.2833	0.57	0.38	0.01	0.33	147.57	37.90	36.90	39.84	2.31
*M8	0.3220	0.33	0.32	-0.05	0.28	10.32	63.04	97.80	68.69	1.08

Percent variance predicted = 5.6% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 1.3. Constituents of the tidal currents at Cuervo (5 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	0.95	2.71	-0.33	2.09	53.82	75.37	3.58	192.87	0.12
*MSF	0.0028	2.43	3.69	-0.44	1.97	177.15	47.12	302.39	115.62	0.43
*ALP1	0.0344	1.40	2.03	0.58	1.04	11.83	43.34	60.16	128.52	0.47
*2Q1	0.0357	1.59	2.07	-0.59	1.44	35.14	54.03	133.88	94.77	0.58
*Q1	0.0372	2.29	2.37	0.17	0.96	175.71	26.66	21.55	80.94	0.93
*O1	0.0387	2.32	2.58	0.03	0.94	173.26	28.15	59.76	70.43	0.81
*NO1	0.0403	1.33	1.90	0.21	0.96	159.81	33.65	45.76	96.82	0.49
*K1	0.0418	1.51	2.16	0.08	1.12	176.16	32.66	286.40	97.92	0.49
*J1	0.0433	1.42	1.70	0.84	1.70	103.09	122.42	154.55	90.11	0.70
*OO1	0.0448	0.54	1.44	-0.10	0.80	156.57	46.81	47.71	175.09	0.14
*UPS1	0.0463	1.39	1.71	-0.10	0.76	176.78	31.89	57.96	99.16	0.66
*EPS2	0.0762	1.24	1.19	0.48	0.92	4.29	51.29	172.68	80.05	1.09
*MU2	0.0777	0.89	1.19	0.19	0.86	174.12	58.58	288.78	94.23	0.56
*N2	0.0790	0.94	0.94	0.20	0.86	149.26	58.94	250.04	77.16	1.00
*M2	0.0805	1.68	1.13	-0.54	0.93	165.01	33.71	298.19	52.30	2.19
*L2	0.0820	0.65	0.92	0.39	0.77	164.76	87.69	58.25	144.77	0.50
*S2	0.0833	1.21	1.15	0.38	0.86	173.51	55.16	319.04	78.24	1.10
*ETA2	0.0851	0.78	0.93	-0.07	0.72	4.15	54.86	271.52	93.83	0.72
*MO3	0.1192	0.29	0.55	-0.19	0.51	162.96	98.53	78.35	153.05	0.27
*M3	0.1208	0.27	0.57	0.08	0.50	13.74	109.99	133.65	163.28	0.24
*MK3	0.1223	0.55	0.70	-0.05	0.57	21.24	74.87	17.21	91.38	0.62
*SK3	0.1251	0.32	0.55	0.16	0.47	173.91	117.13	186.35	198.62	0.32
*MN4	0.1595	0.23	0.44	-0.05	0.41	162.15	90.11	88.48	143.24	0.28
*M4	0.1610	0.33	0.50	-0.03	0.47	29.90	92.06	18.23	141.04	0.44
*SN4	0.1623	0.48	0.50	-0.11	0.52	37.58	77.83	82.14	89.17	0.93
*MS4	0.1638	0.48	0.52	-0.18	0.51	121.45	93.82	324.04	93.81	0.83
*S4	0.1667	0.20	0.42	0.14	0.46	72.39	130.52	326.75	158.38	0.22
*2MK5	0.2028	0.20	0.33	-0.13	0.30	53.04	86.99	6.39	137.55	0.37
*2SK5	0.2084	0.38	0.32	0.14	0.30	32.18	68.30	108.95	74.44	1.39
*2MN6	0.2400	0.18	0.26	0.05	0.23	10.83	78.68	80.79	122.72	0.46
*M6	0.2415	0.29	0.28	-0.05	0.29	118.16	71.88	40.90	63.08	1.09
*2MS6	0.2444	0.29	0.28	0.04	0.22	22.89	58.85	264.45	65.54	1.06
*2SM6	0.2472	0.42	0.23	0.08	0.34	62.45	52.60	294.17	48.02	3.25
*3MK7	0.2833	0.12	0.25	0.02	0.25	29.80	127.34	271.92	143.63	0.25
*M8	0.3220	0.36	0.26	-0.15	0.21	4.76	53.47	155.42	58.01	1.92

Percent variance predicted = 5.8% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 1.4. Constituents of the tidal currents at Cuervo (9 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	1.96	2.92	-0.32	1.28	174.53	31.53	287.99	105.81	0.45
*MSF	0.0028	5.62	3.70	0.57	1.32	8.95	16.04	228.37	41.75	2.30
*ALP1	0.0344	0.24	0.57	-0.06	0.52	94.29	144.32	14.73	157.13	0.17
*2Q1	0.0357	0.35	0.54	-0.17	0.60	125.76	117.23	9.90	148.35	0.43
*Q1	0.0372	0.56	0.67	-0.17	0.57	118.69	95.13	13.62	95.53	0.70
*O1	0.0387	0.20	0.51	0.02	0.56	118.97	120.72	355.49	166.06	0.16
*NO1	0.0403	0.17	0.46	0.09	0.44	74.80	139.80	322.52	186.25	0.13
*K1	0.0418	0.65	0.76	0.09	0.60	8.88	64.04	83.73	88.93	0.73
*J1	0.0433	0.73	0.62	-0.13	0.77	52.22	81.86	210.82	69.20	1.39
*OO1	0.0448	0.37	0.52	-0.13	0.47	128.43	106.81	46.65	107.45	0.51
*UPS1	0.0463	0.58	0.60	-0.16	0.53	75.36	76.10	84.50	68.15	0.93
*EPS2	0.0762	0.73	0.78	0.00	0.56	6.48	58.13	135.74	89.94	0.88
*MU2	0.0777	0.37	0.65	0.29	0.67	145.61	103.42	15.55	143.11	0.32
*N2	0.0790	0.67	0.80	0.12	0.57	26.58	51.85	142.48	82.72	0.70
*M2	0.0805	1.17	0.91	-0.06	0.69	175.26	35.34	296.91	53.95	1.64
*L2	0.0820	0.36	0.60	-0.01	0.58	78.32	139.35	206.19	114.09	0.36
*S2	0.0833	0.98	0.82	0.47	0.69	9.54	52.26	132.46	73.44	1.43
*ETA2	0.0851	0.29	0.62	-0.12	0.58	39.59	96.08	12.52	141.03	0.22
*MO3	0.1192	0.35	0.41	0.07	0.38	62.53	80.77	114.02	79.83	0.75
*M3	0.1208	0.08	0.38	0.01	0.31	4.21	151.47	87.66	226.77	0.04
*MK3	0.1223	0.14	0.29	-0.01	0.32	41.58	125.58	298.41	182.16	0.23
*SK3	0.1251	0.23	0.35	-0.01	0.34	4.38	133.02	335.22	130.56	0.45
*MN4	0.1595	0.25	0.29	0.06	0.24	24.74	80.56	184.42	92.08	0.72
*M4	0.1610	0.20	0.29	0.01	0.26	11.95	102.28	142.80	124.69	0.50
*SN4	0.1623	0.39	0.32	0.13	0.30	101.87	66.16	200.97	63.46	1.45
*MS4	0.1638	0.13	0.27	0.05	0.26	7.64	114.11	312.91	159.01	0.24
*S4	0.1667	0.28	0.27	0.01	0.28	53.22	71.36	18.15	83.95	1.03
*2MK5	0.2028	0.04	0.21	-0.00	0.20	176.75	134.42	184.26	189.52	0.03
*2SK5	0.2084	0.19	0.24	0.02	0.25	150.58	91.95	101.20	101.73	0.62
*2MN6	0.2400	0.10	0.22	-0.02	0.19	118.55	90.92	42.56	172.73	0.21
*M6	0.2415	0.11	0.22	-0.01	0.18	43.85	118.26	312.41	128.49	0.24
*2MS6	0.2444	0.15	0.20	-0.07	0.18	25.00	114.40	177.78	104.59	0.57
*2SM6	0.2472	0.16	0.22	-0.01	0.18	129.60	98.96	207.33	111.67	0.49
*3MK7	0.2833	0.13	0.18	-0.02	0.19	144.13	104.63	262.89	111.30	0.49
*M8	0.3220	0.11	0.13	0.01	0.15	158.54	104.79	34.40	109.39	0.72

Percent variance predicted = 15.9% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 1.5. Constituents of the tidal currents at Cuervo (12 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	1.49	3.13	0.10	1.05	160.86	25.27	319.18	131.21	0.23
*MSF	0.0028	4.32	3.70	-0.11	1.00	8.17	12.16	230.56	58.98	1.37
*ALP1	0.0344	0.30	0.43	-0.07	0.38	145.12	82.03	130.49	100.59	0.47
*2Q1	0.0357	0.28	0.43	0.07	0.36	0.80	77.73	99.17	126.92	0.42
*Q1	0.0372	0.37	0.44	-0.22	0.40	59.64	114.24	44.08	105.55	0.70
*O1	0.0387	0.36	0.38	-0.11	0.42	81.01	98.61	57.84	84.90	0.88
*NO1	0.0403	0.37	0.40	-0.08	0.44	87.43	99.36	33.09	77.47	0.90
*K1	0.0418	0.19	0.39	-0.03	0.43	92.97	154.24	10.31	140.31	0.25
*J1	0.0433	0.45	0.50	0.05	0.40	13.77	64.59	236.37	88.78	0.80
*OO1	0.0448	0.37	0.39	-0.14	0.31	177.87	68.07	338.77	123.38	0.89
*UPS1	0.0463	0.37	0.37	-0.16	0.32	27.86	67.81	74.37	98.14	1.01
*EPS2	0.0762	0.79	0.67	0.12	0.57	13.91	41.86	124.75	55.19	1.41
*MU2	0.0777	0.28	0.48	-0.04	0.51	158.21	92.32	187.52	149.21	0.33
*N2	0.0790	0.56	0.52	0.07	0.46	24.01	67.72	124.48	69.43	1.15
*M2	0.0805	1.14	0.62	0.42	0.53	175.28	32.23	311.35	38.13	3.34
*L2	0.0820	0.39	0.50	0.26	0.47	46.75	101.69	129.61	108.33	0.61
*S2	0.0833	0.82	0.51	0.02	0.52	166.15	39.17	334.28	45.87	2.52
*ETA2	0.0851	0.32	0.45	0.15	0.40	7.02	89.40	42.43	115.81	0.51
*MO3	0.1192	0.16	0.25	0.05	0.23	105.43	103.28	77.20	142.19	0.42
*M3	0.1208	0.14	0.26	0.10	0.26	86.66	113.52	1.05	165.28	0.29
*MK3	0.1223	0.12	0.27	0.01	0.23	17.54	128.05	257.29	167.79	0.19
*SK3	0.1251	0.16	0.27	0.09	0.26	52.01	127.24	302.81	142.40	0.35
*MN4	0.1595	0.21	0.19	0.05	0.22	175.55	75.11	258.69	77.53	1.22
*M4	0.1610	0.12	0.19	-0.02	0.19	61.94	115.56	117.45	113.07	0.37
*SN4	0.1623	0.28	0.23	0.03	0.22	16.55	57.36	97.46	59.77	1.58
*MS4	0.1638	0.12	0.19	0.05	0.19	4.82	115.49	258.76	121.71	0.45
*S4	0.1667	0.07	0.16	-0.01	0.16	21.87	133.29	156.16	164.33	0.20
*2MK5	0.2028	0.16	0.22	-0.02	0.17	56.83	66.98	71.91	123.32	0.53
*2SK5	0.2084	0.16	0.21	0.06	0.17	118.29	72.69	139.03	106.23	0.55
*2MN6	0.2400	0.14	0.18	0.01	0.16	61.95	73.11	168.50	90.94	0.68
*M6	0.2415	0.23	0.17	-0.06	0.20	0.93	73.67	60.15	60.16	1.70
*2MS6	0.2444	0.15	0.17	0.08	0.17	33.12	114.07	116.71	95.87	0.83
*2SM6	0.2472	0.08	0.14	0.01	0.15	157.45	127.30	239.26	175.27	0.32
*3MK7	0.2833	0.10	0.13	-0.04	0.12	80.93	105.45	183.37	113.11	0.59
*M8	0.3220	0.13	0.12	0.05	0.13	67.59	73.83	17.68	73.00	1.19

Percent variance predicted = 15.1% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 1.6. Constituents of the tidal currents at Cuervo (16 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	1.55	2.48	-0.07	0.81	168.58	28.87	346.85	85.95	0.39
*MSF	0.0028	2.26	2.60	0.24	0.93	176.12	20.91	63.56	80.99	0.75
*ALP1	0.0344	0.32	0.40	-0.17	0.33	176.15	91.76	138.31	108.13	0.65
*2Q1	0.0357	0.57	0.42	-0.20	0.40	81.32	64.77	286.27	48.02	1.87
*Q1	0.0372	0.26	0.32	-0.11	0.34	95.23	117.95	262.85	114.03	0.66
*O1	0.0387	0.26	0.37	0.08	0.34	113.48	107.73	219.62	107.26	0.48
*NO1	0.0403	0.22	0.31	-0.15	0.29	14.33	108.83	86.47	133.73	0.50
*K1	0.0418	0.38	0.40	-0.20	0.35	144.86	80.25	261.22	81.84	0.89
*J1	0.0433	0.23	0.33	-0.01	0.34	172.84	120.87	176.99	157.61	0.46
*OO1	0.0448	0.24	0.29	-0.04	0.27	143.58	81.83	12.91	97.29	0.65
*UPS1	0.0463	0.22	0.28	0.11	0.28	34.18	102.17	117.69	107.84	0.62
*EPS2	0.0762	0.20	0.33	0.04	0.32	98.78	144.79	352.88	121.52	0.35
*MU2	0.0777	0.39	0.47	0.03	0.40	147.94	66.81	163.59	64.50	0.70
*N2	0.0790	0.17	0.42	0.06	0.32	17.04	82.61	183.04	189.06	0.16
*M2	0.0805	1.40	0.54	0.71	0.40	9.69	27.82	167.65	33.34	6.77
*L2	0.0820	0.17	0.38	0.04	0.27	171.52	80.35	207.67	167.32	0.19
*S2	0.0833	0.97	0.56	0.17	0.39	171.98	23.82	346.05	34.62	3.07
*ETA2	0.0851	0.05	0.30	-0.01	0.28	79.90	129.13	336.29	226.86	0.03
*MO3	0.1192	0.18	0.19	0.12	0.18	141.98	99.14	97.62	118.04	0.89
*M3	0.1208	0.14	0.19	0.06	0.19	68.87	113.72	50.63	121.65	0.58
*MK3	0.1223	0.17	0.21	0.10	0.17	80.95	104.50	244.14	106.37	0.61
*SK3	0.1251	0.06	0.18	0.02	0.16	77.49	145.18	265.16	172.00	0.12
*MN4	0.1595	0.12	0.18	0.08	0.18	5.12	92.13	32.91	119.85	0.42
*M4	0.1610	0.11	0.15	-0.00	0.17	80.76	99.88	158.44	115.18	0.56
*SN4	0.1623	0.10	0.18	0.07	0.16	175.07	131.24	272.13	198.57	0.28
*MS4	0.1638	0.18	0.17	0.02	0.16	24.34	67.02	233.02	74.48	1.08
*S4	0.1667	0.07	0.16	-0.01	0.12	7.42	113.66	184.76	172.60	0.18
*2MK5	0.2028	0.08	0.20	0.00	0.16	53.28	79.17	4.26	150.95	0.18
*2SK5	0.2084	0.14	0.17	0.03	0.19	13.30	122.16	346.61	89.21	0.76
*2MN6	0.2400	0.17	0.15	-0.00	0.14	81.89	54.02	148.99	68.69	1.28
*M6	0.2415	0.08	0.11	0.00	0.12	15.55	122.50	166.92	116.54	0.49
*2MS6	0.2444	0.14	0.14	0.07	0.14	88.77	78.72	173.91	101.21	0.89
*2SM6	0.2472	0.10	0.13	0.04	0.12	87.50	90.46	193.73	125.81	0.58
*3MK7	0.2833	0.12	0.10	0.01	0.11	109.14	61.75	166.50	62.26	1.53
*M8	0.3220	0.04	0.08	0.01	0.07	16.54	104.36	269.67	142.76	0.25

Percent variance predicted = 12.6% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 1.7. Constituents of the tidal currents at Cuervo (20 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	1.27	1.30	-0.16	1.02	149.38	53.22	358.03	66.98	0.96
*MSF	0.0028	1.10	1.36	0.13	0.86	164.94	46.45	55.48	85.17	0.65
*ALP1	0.0344	0.17	0.22	0.06	0.19	22.91	73.12	300.80	127.81	0.63
*2Q1	0.0357	0.26	0.24	0.10	0.22	34.98	70.21	354.21	82.65	1.16
*Q1	0.0372	0.41	0.30	0.03	0.20	14.59	31.47	344.20	49.03	1.87
*O1	0.0387	0.21	0.21	0.01	0.21	134.99	73.56	209.78	87.69	1.00
*NO1	0.0403	0.23	0.24	-0.03	0.16	179.53	53.22	262.67	104.33	0.93
*K1	0.0418	0.58	0.31	-0.01	0.22	165.89	20.43	269.32	33.98	3.51
*J1	0.0433	0.14	0.23	-0.02	0.18	160.45	76.94	327.51	143.11	0.36
*OO1	0.0448	0.16	0.17	0.06	0.15	34.42	74.17	91.37	87.00	0.83
*UPS1	0.0463	0.17	0.18	0.07	0.16	147.09	70.83	209.59	98.64	0.86
*EPS2	0.0762	0.23	0.32	0.12	0.30	69.14	127.45	329.59	111.85	0.54
*MU2	0.0777	0.37	0.37	0.14	0.30	158.33	55.87	131.79	85.15	1.03
*N2	0.0790	0.29	0.35	0.13	0.27	5.84	68.16	207.05	114.81	0.68
*M2	0.0805	1.45	0.45	0.70	0.31	15.97	18.82	189.46	24.56	10.52
*L2	0.0820	0.15	0.30	0.03	0.23	171.80	69.38	111.03	130.22	0.24
*S2	0.0833	0.94	0.52	0.34	0.28	161.69	23.21	9.23	34.05	3.33
*ETA2	0.0851	0.20	0.26	0.09	0.22	160.66	80.44	35.66	124.28	0.57
*MO3	0.1192	0.14	0.18	0.10	0.18	174.23	114.27	98.49	114.26	0.65
*M3	0.1208	0.09	0.19	-0.02	0.17	21.50	109.89	319.75	155.93	0.25
*MK3	0.1223	0.18	0.18	0.14	0.17	61.27	118.24	259.40	119.30	0.95
*SK3	0.1251	0.14	0.16	0.07	0.19	109.56	100.96	279.14	100.68	0.78
*MN4	0.1595	0.03	0.10	-0.00	0.10	137.22	116.95	240.96	210.57	0.08
*M4	0.1610	0.12	0.13	-0.03	0.12	31.74	85.14	198.63	84.60	0.81
*SN4	0.1623	0.12	0.12	0.05	0.12	146.66	89.00	345.01	93.23	0.91
*MS4	0.1638	0.07	0.11	0.02	0.11	113.01	98.31	138.52	126.09	0.40
*S4	0.1667	0.14	0.13	0.05	0.11	44.42	70.71	186.69	75.02	1.13
*2MK5	0.2028	0.08	0.17	0.01	0.15	39.23	84.27	18.88	146.81	0.25
*2SK5	0.2084	0.07	0.15	0.03	0.16	16.67	110.69	317.26	152.89	0.25
*2MN6	0.2400	0.13	0.11	-0.03	0.10	80.50	52.31	129.56	73.99	1.35
*M6	0.2415	0.04	0.09	-0.01	0.09	138.84	115.00	317.96	160.43	0.22
*2MS6	0.2444	0.05	0.09	0.01	0.09	62.58	99.23	139.86	158.03	0.31
*2SM6	0.2472	0.11	0.11	0.02	0.09	62.63	64.08	169.11	78.48	1.06
*3MK7	0.2833	0.10	0.10	0.03	0.10	169.80	80.49	162.39	86.56	1.04
*M8	0.3220	0.08	0.09	-0.00	0.07	124.08	79.95	53.06	81.54	0.72

Percent variance predicted = 13.0% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 1.8. Constituents of the tidal currents at Cuervo (23 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	1.28	1.07	-0.27	1.04	123.18	60.14	359.46	55.36	1.43
*MSF	0.0028	0.80	0.93	0.11	0.84	154.90	79.75	57.93	87.89	0.73
*ALP1	0.0344	0.09	0.19	0.01	0.17	16.16	70.36	318.25	149.15	0.21
*2Q1	0.0357	0.21	0.17	-0.10	0.21	117.95	96.11	348.97	85.66	1.47
*Q1	0.0372	0.32	0.28	0.02	0.18	178.37	32.41	191.99	52.07	1.37
*O1	0.0387	0.15	0.20	-0.05	0.16	173.11	69.23	224.19	121.97	0.61
*NO1	0.0403	0.15	0.19	0.03	0.14	17.34	59.59	43.15	89.73	0.61
*K1	0.0418	0.46	0.25	-0.07	0.22	24.67	28.98	68.90	37.21	3.37
*J1	0.0433	0.08	0.18	-0.02	0.17	67.67	130.44	7.16	165.70	0.22
*OO1	0.0448	0.05	0.14	0.00	0.12	151.86	85.36	251.35	180.85	0.15
*UPS1	0.0463	0.11	0.15	0.02	0.12	165.24	63.28	191.28	145.47	0.57
*EPS2	0.0762	0.18	0.27	0.08	0.27	78.22	134.28	317.91	117.60	0.43
*MU2	0.0777	0.34	0.35	-0.07	0.26	0.44	45.50	296.29	67.00	0.94
*N2	0.0790	0.27	0.33	0.20	0.28	163.53	85.08	24.18	104.28	0.70
*M2	0.0805	1.28	0.37	0.51	0.25	2.54	15.45	203.46	24.64	11.74
*L2	0.0820	0.10	0.23	0.06	0.24	171.92	77.01	129.44	167.70	0.21
*S2	0.0833	0.88	0.37	0.28	0.28	154.72	20.78	18.39	29.81	5.51
*ETA2	0.0851	0.06	0.21	0.01	0.21	128.85	110.04	356.20	184.25	0.08
*MO3	0.1192	0.13	0.15	0.11	0.16	86.59	133.20	17.06	133.74	0.80
*M3	0.1208	0.09	0.17	-0.05	0.16	19.18	115.23	318.15	145.09	0.28
*MK3	0.1223	0.10	0.13	0.08	0.13	163.71	130.62	327.27	137.24	0.61
*SK3	0.1251	0.11	0.14	0.09	0.14	171.43	116.15	310.21	124.92	0.58
*MN4	0.1595	0.12	0.15	0.00	0.13	103.91	68.44	185.24	92.72	0.66
*M4	0.1610	0.08	0.12	-0.02	0.11	140.17	103.45	93.05	134.71	0.38
*SN4	0.1623	0.10	0.13	0.07	0.11	113.90	97.91	310.14	125.37	0.57
*MS4	0.1638	0.08	0.11	-0.02	0.12	174.55	124.17	10.17	124.71	0.48
*S4	0.1667	0.11	0.15	-0.01	0.11	100.55	67.15	168.90	89.10	0.51
*2MK5	0.2028	0.05	0.15	-0.02	0.14	155.33	105.86	271.34	174.94	0.10
*2SK5	0.2084	0.05	0.14	0.02	0.12	44.53	95.83	22.75	177.12	0.15
*2MN6	0.2400	0.08	0.11	-0.05	0.11	143.80	93.73	101.39	148.84	0.52
*M6	0.2415	0.07	0.10	0.06	0.11	149.34	113.46	288.12	157.12	0.44
*2MS6	0.2444	0.10	0.10	-0.03	0.13	32.99	103.07	175.31	100.72	0.89
*2SM6	0.2472	0.13	0.15	0.02	0.10	103.94	56.16	203.62	80.05	0.67
*3MK7	0.2833	0.12	0.10	0.03	0.10	12.83	66.60	11.69	61.65	1.58
*M8	0.3220	0.08	0.08	0.00	0.07	164.15	70.74	69.80	75.94	0.95

Percent variance predicted = 11.8% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 1.9. Constituents of the tidal currents at Cuervo (27 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	1.27	0.78	-0.20	0.98	115.70	53.17	3.68	38.43	2.65
*MSF	0.0028	0.53	0.77	0.27	0.57	179.86	78.33	111.36	157.52	0.48
*ALP1	0.0344	0.14	0.21	0.12	0.21	148.23	116.08	169.01	150.40	0.45
*2Q1	0.0357	0.11	0.19	0.00	0.16	123.25	126.30	51.72	141.54	0.32
*Q1	0.0372	0.28	0.24	-0.03	0.19	163.77	48.22	199.49	60.26	1.34
*O1	0.0387	0.18	0.21	0.07	0.17	159.92	72.68	225.93	100.38	0.72
*NO1	0.0403	0.11	0.16	-0.03	0.14	40.73	96.59	356.68	115.77	0.43
*K1	0.0418	0.38	0.28	-0.09	0.20	168.39	35.54	270.16	47.61	1.79
*J1	0.0433	0.09	0.20	-0.05	0.15	159.83	106.65	250.85	185.74	0.21
*OO1	0.0448	0.08	0.14	-0.02	0.13	109.31	132.71	245.64	137.32	0.31
*UPS1	0.0463	0.13	0.17	-0.03	0.13	161.66	69.99	241.22	97.92	0.61
*EPS2	0.0762	0.34	0.34	0.16	0.33	30.13	86.11	24.53	84.62	0.99
*MU2	0.0777	0.28	0.30	0.05	0.30	161.39	88.40	130.86	87.45	0.87
*N2	0.0790	0.31	0.30	0.14	0.29	6.62	73.30	242.39	90.93	1.08
*M2	0.0805	1.16	0.42	0.39	0.32	0.20	20.07	222.86	22.68	7.81
*L2	0.0820	0.09	0.23	0.03	0.25	41.47	113.07	293.59	184.59	0.15
*S2	0.0833	0.73	0.35	0.19	0.35	152.09	31.48	31.98	34.59	4.25
*ETA2	0.0851	0.10	0.21	0.01	0.22	147.75	124.24	198.77	160.28	0.20
*MO3	0.1192	0.23	0.13	0.12	0.14	80.27	64.13	39.04	65.37	3.19
*M3	0.1208	0.10	0.13	-0.00	0.13	48.35	93.18	306.95	108.12	0.58
*MK3	0.1223	0.10	0.13	0.02	0.12	85.36	107.76	201.93	109.03	0.58
*SK3	0.1251	0.16	0.11	0.03	0.15	117.65	78.32	217.84	73.38	2.03
*MN4	0.1595	0.10	0.13	-0.00	0.12	70.00	75.86	187.72	107.72	0.56
*M4	0.1610	0.18	0.15	0.12	0.12	149.33	92.16	62.20	87.38	1.45
*SN4	0.1623	0.06	0.11	0.00	0.11	5.81	140.08	166.36	156.14	0.28
*MS4	0.1638	0.06	0.13	0.01	0.11	66.55	112.85	108.53	127.77	0.24
*S4	0.1667	0.19	0.14	0.00	0.12	87.76	46.57	140.16	57.38	1.69
*2MK5	0.2028	0.09	0.14	0.07	0.13	0.13	145.80	36.11	115.67	0.48
*2SK5	0.2084	0.06	0.13	-0.01	0.13	59.27	99.85	320.15	150.44	0.22
*2MN6	0.2400	0.06	0.11	-0.02	0.09	89.72	93.80	112.10	156.19	0.32
*M6	0.2415	0.13	0.12	0.02	0.10	58.73	71.61	263.75	75.29	1.32
*2MS6	0.2444	0.08	0.10	-0.01	0.09	123.87	90.96	127.40	102.97	0.66
*2SM6	0.2472	0.10	0.11	-0.05	0.09	71.15	76.17	186.50	104.71	0.79
*3MK7	0.2833	0.08	0.08	0.04	0.08	71.32	114.26	99.28	103.05	0.86
*M8	0.3220	0.10	0.08	-0.01	0.07	0.96	49.75	249.36	52.41	1.64

Percent variance predicted = 10.8% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Gato

2) ADCP WH 300 Khz
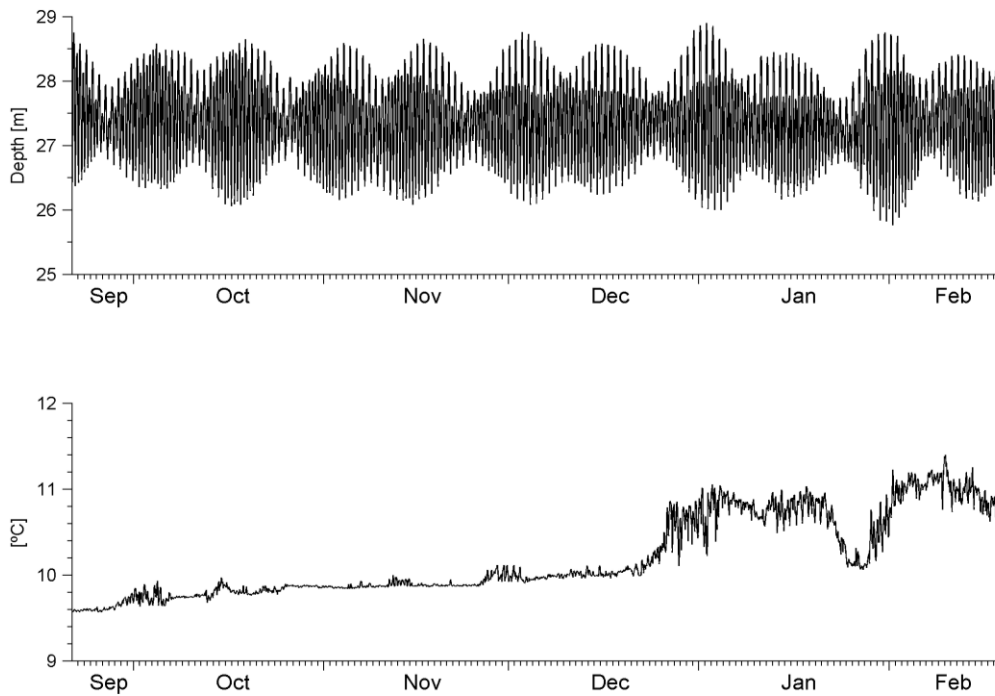
Figure 2.1. Depth and temperature ADCP. Hourly data. Location Gato.
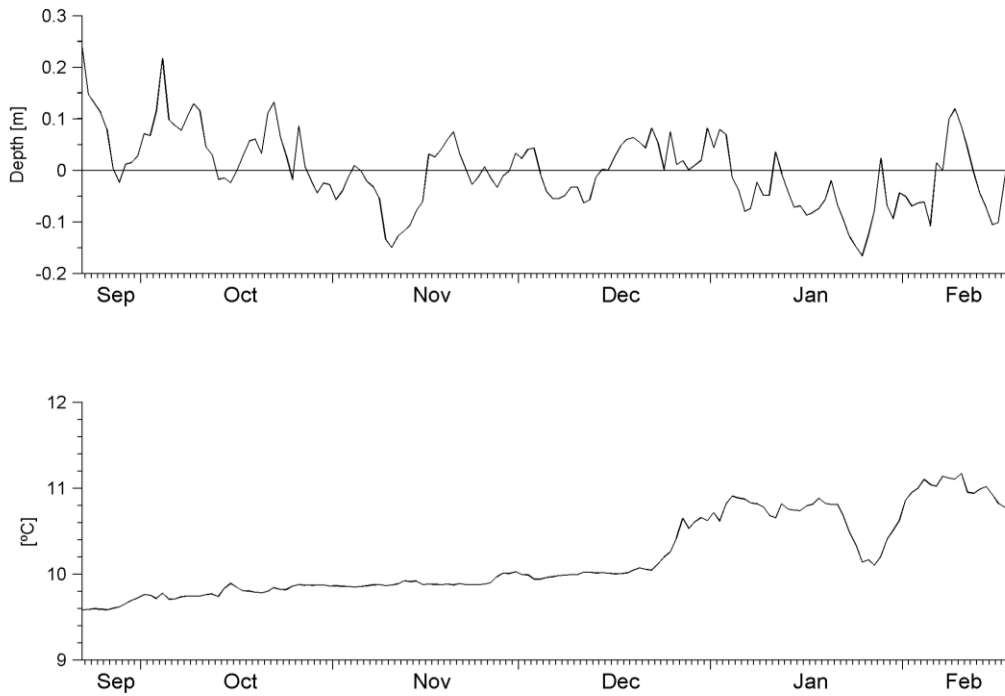
Figure 2.2. Depth anomaly and temperature ADCP. Daily data. Location Gato.
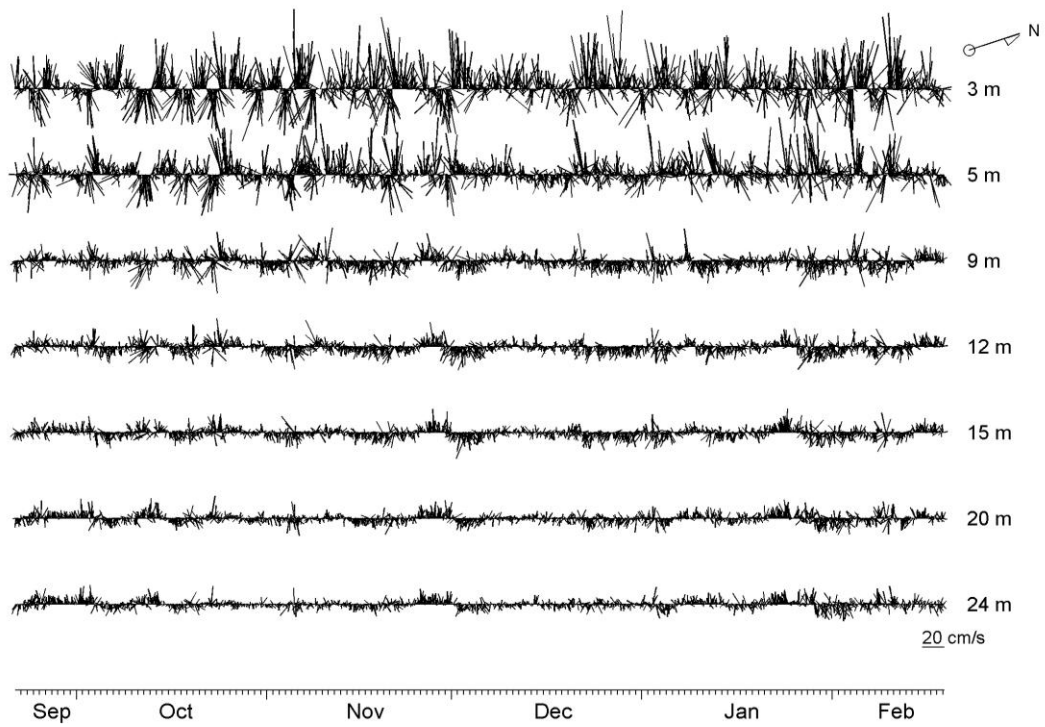
Figure 2.3. Current vectors. Data re-sampled each two hours. Location Gato.
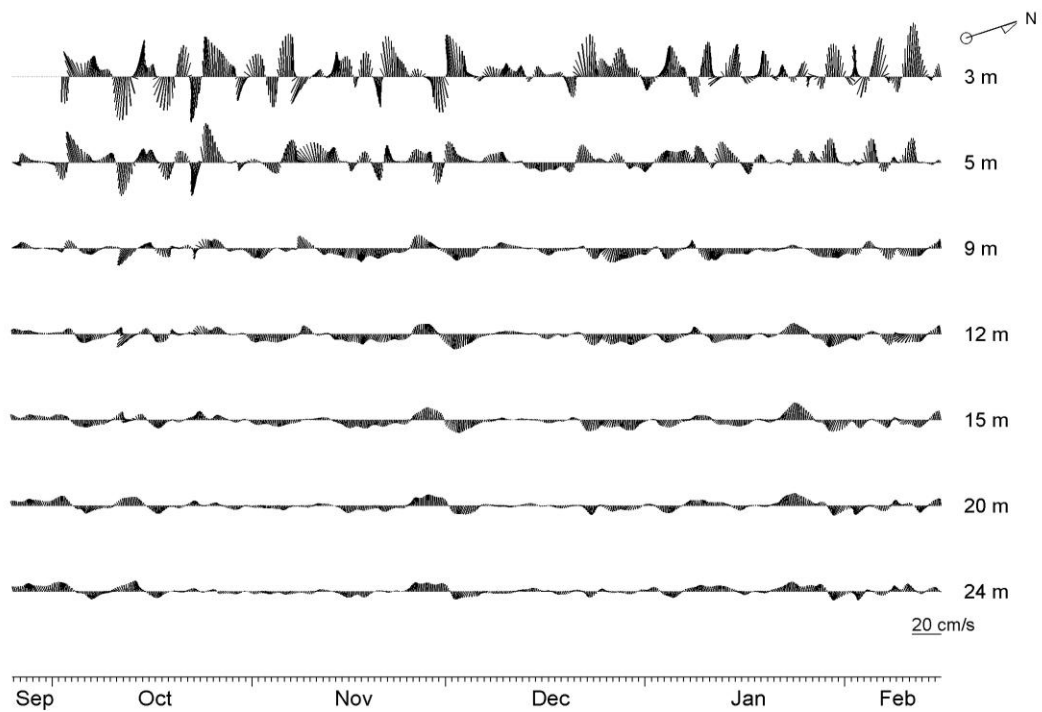
Figure 2.4. Currents vector. Flitered data and resampled each six hours. Location Gato.
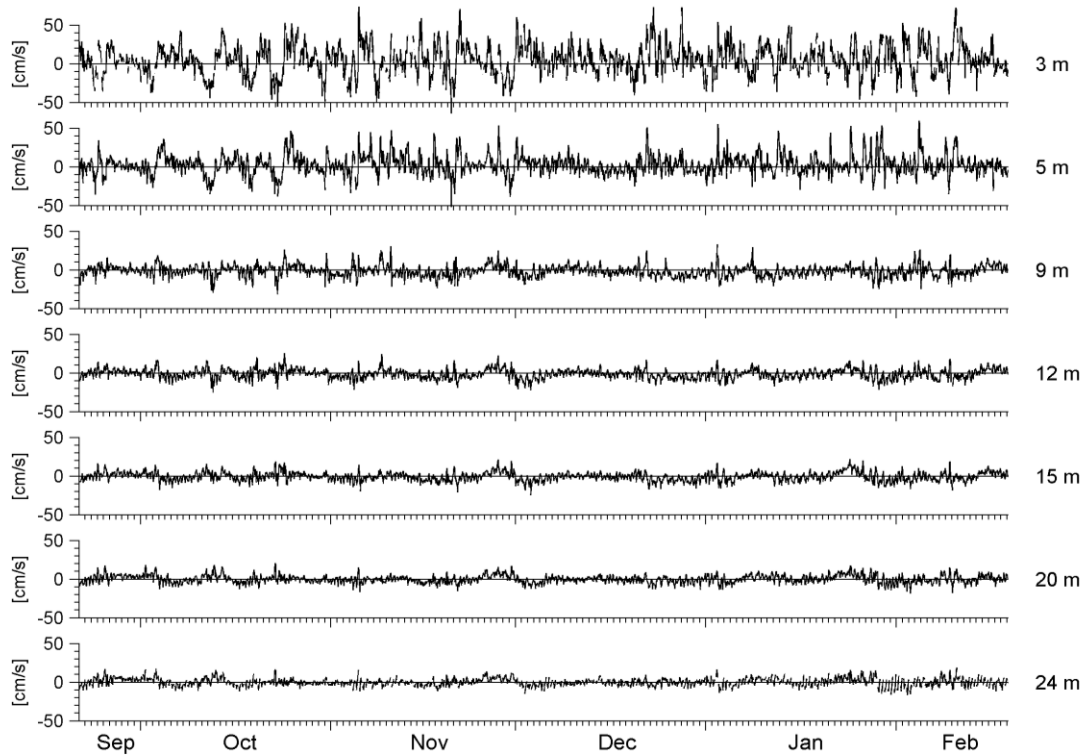
Figure 2.5. Components U (along fjord). Hourly data. Location Gato.
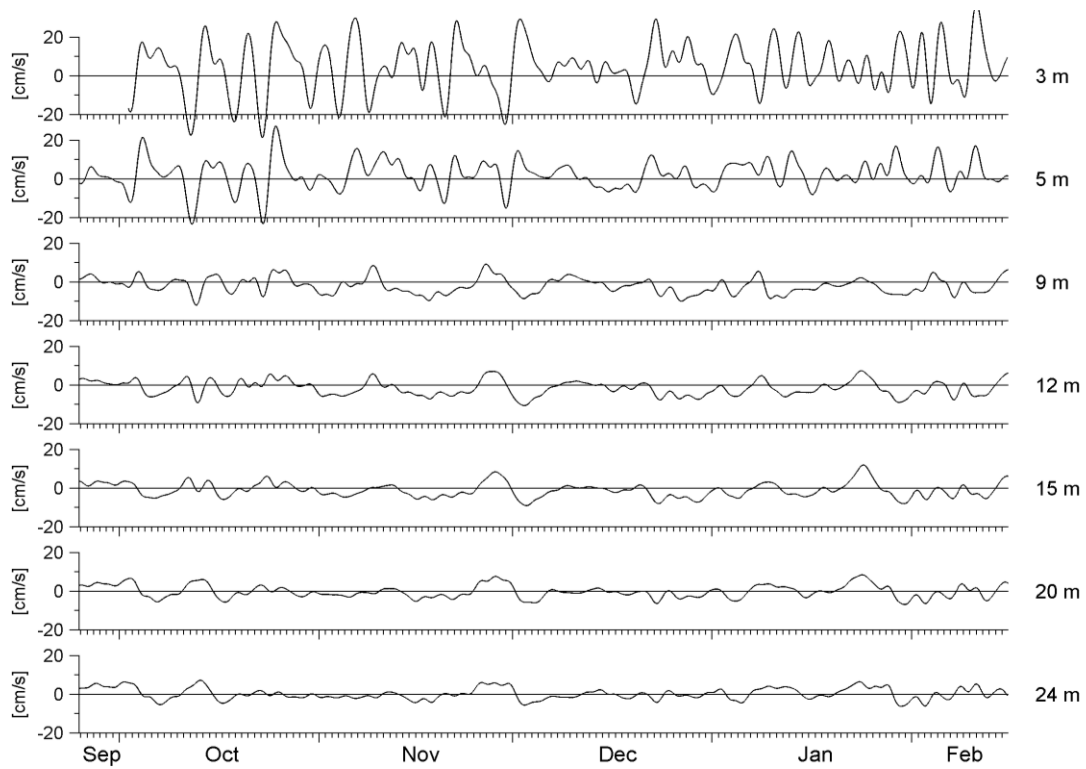
Figure 2.6. Components U (along fjord). Filtered data. Location Gato.
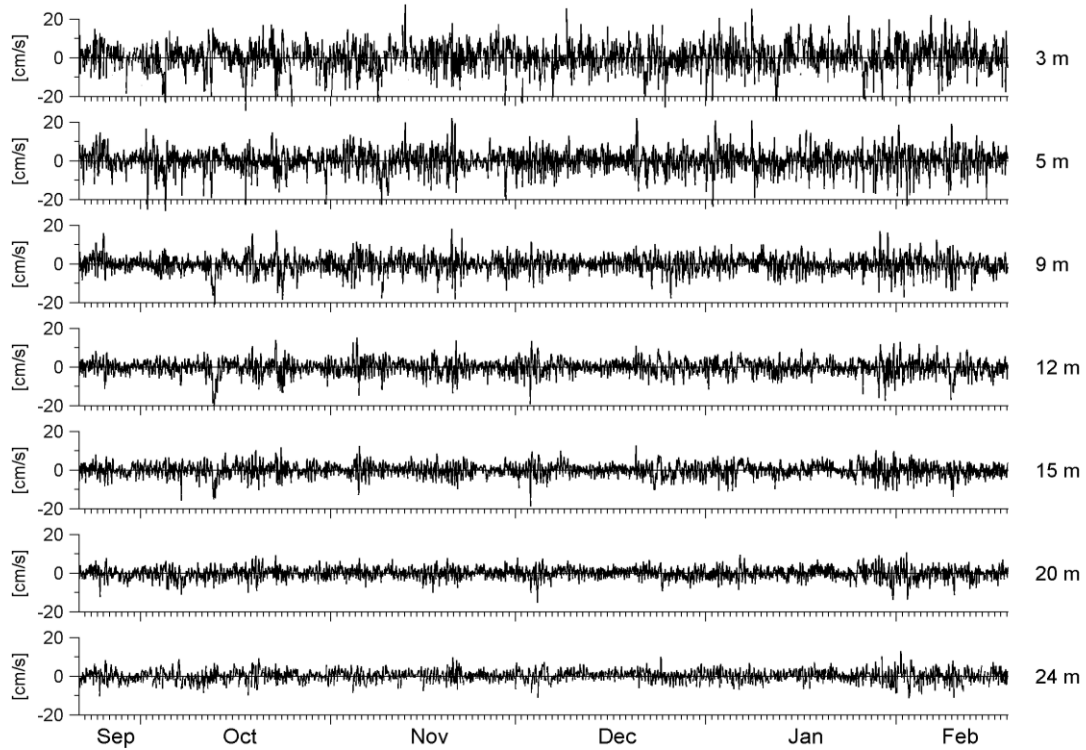
Figure 2.7. Components V (cross fjord). Hourly data. Location Gato.
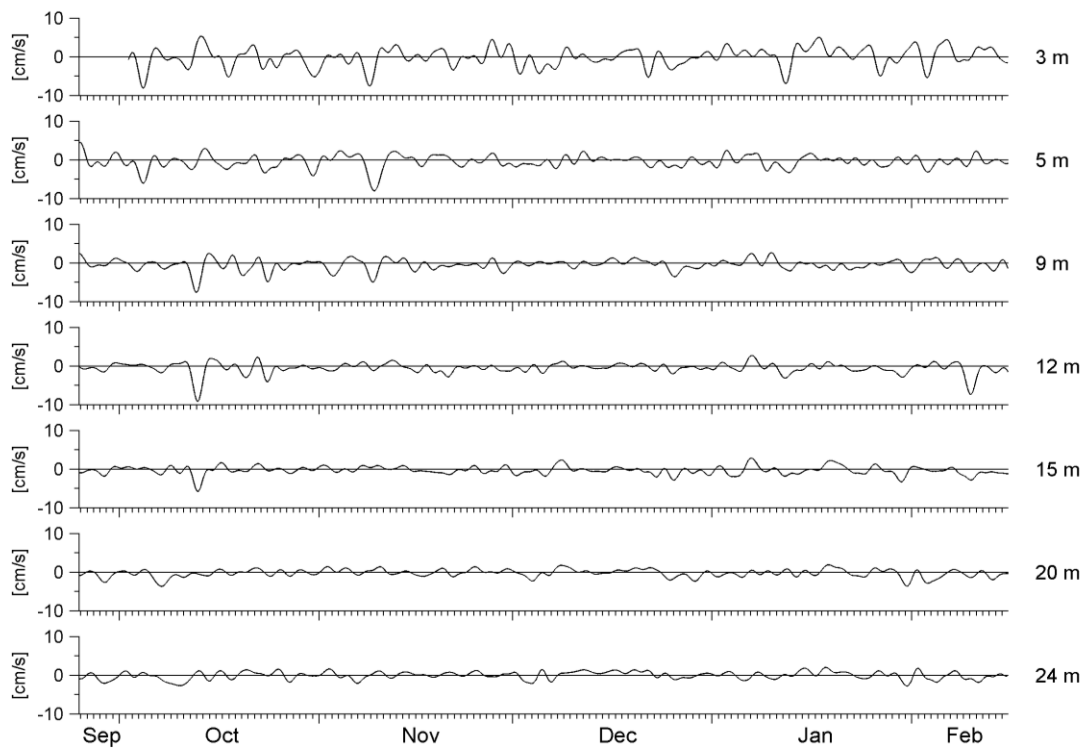
Figure 2.8. Components V (cross fjord). Filtered data. Location Gato.
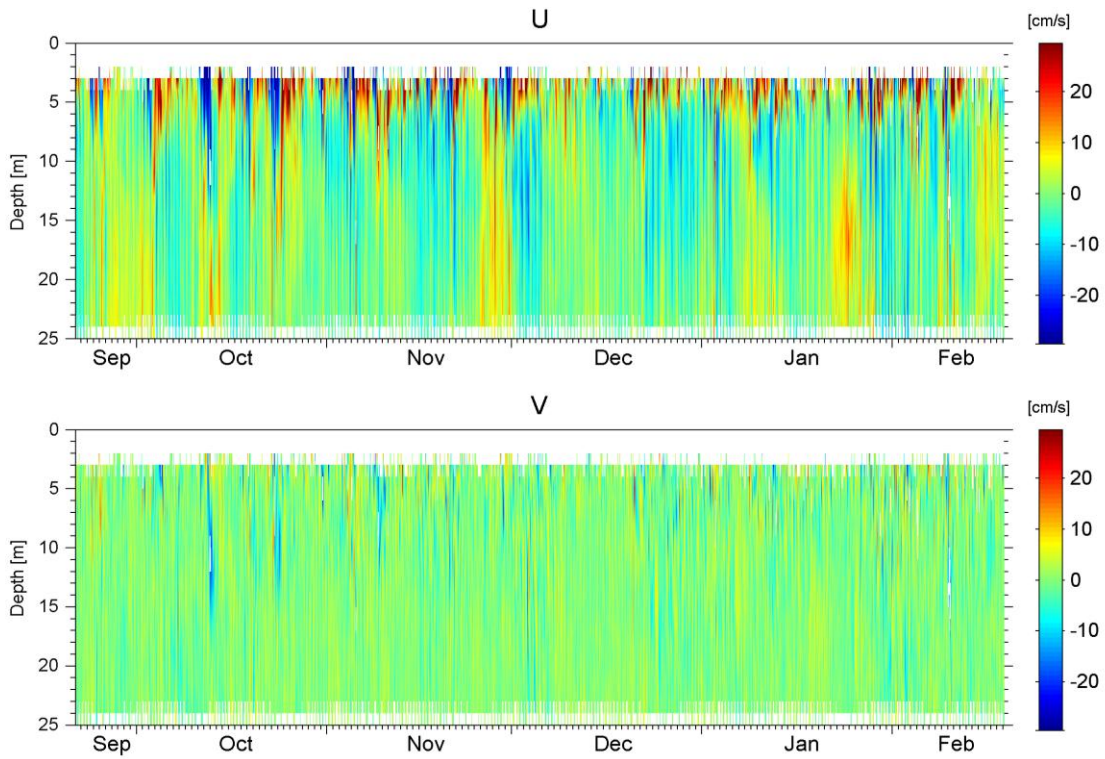
Figure 2.9. Components U (along fjord) and V(cross fjord). Location Gato.
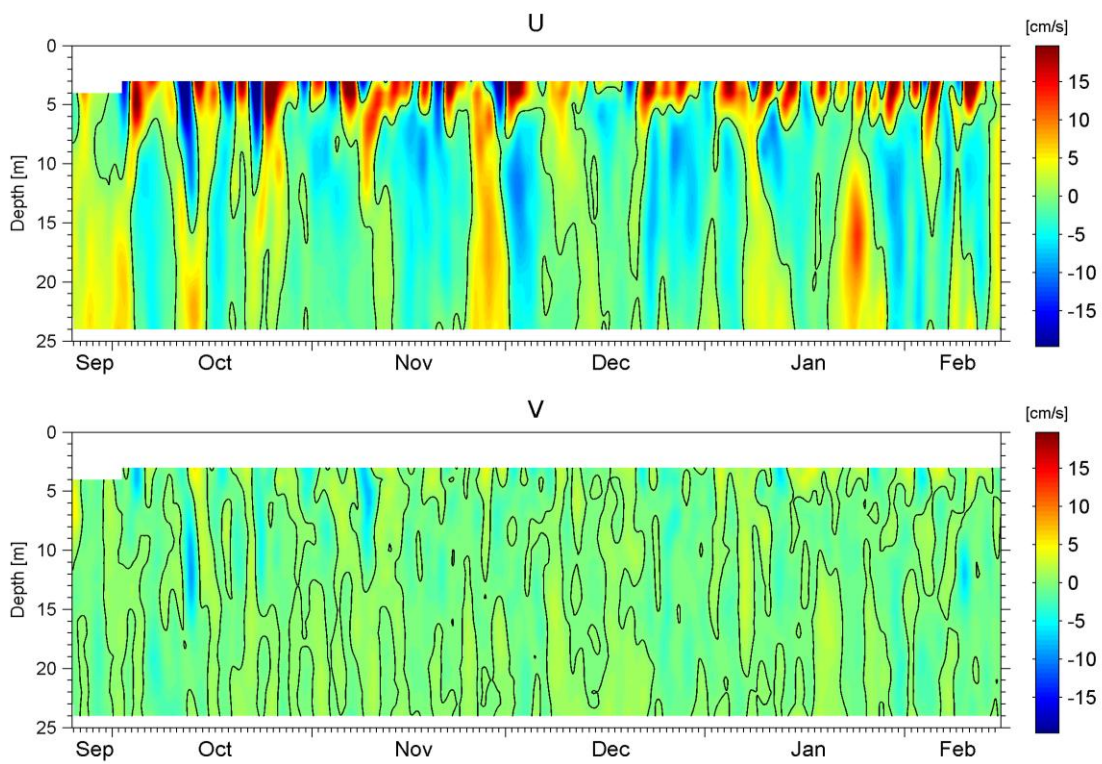
Figure 2.10. Components U (along fjord) and V(cross fjord). Filtered data. Location Gato.
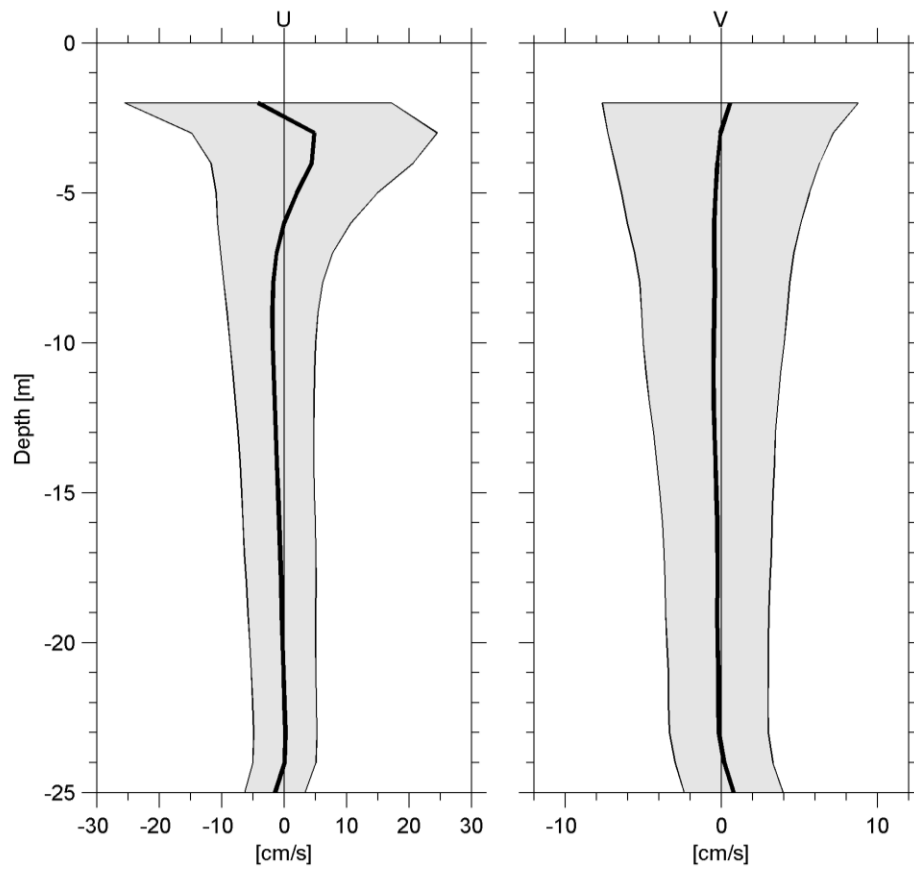
Figure 2.11. Profile average of along (U) and cross (V) fjord components. Location Gato.
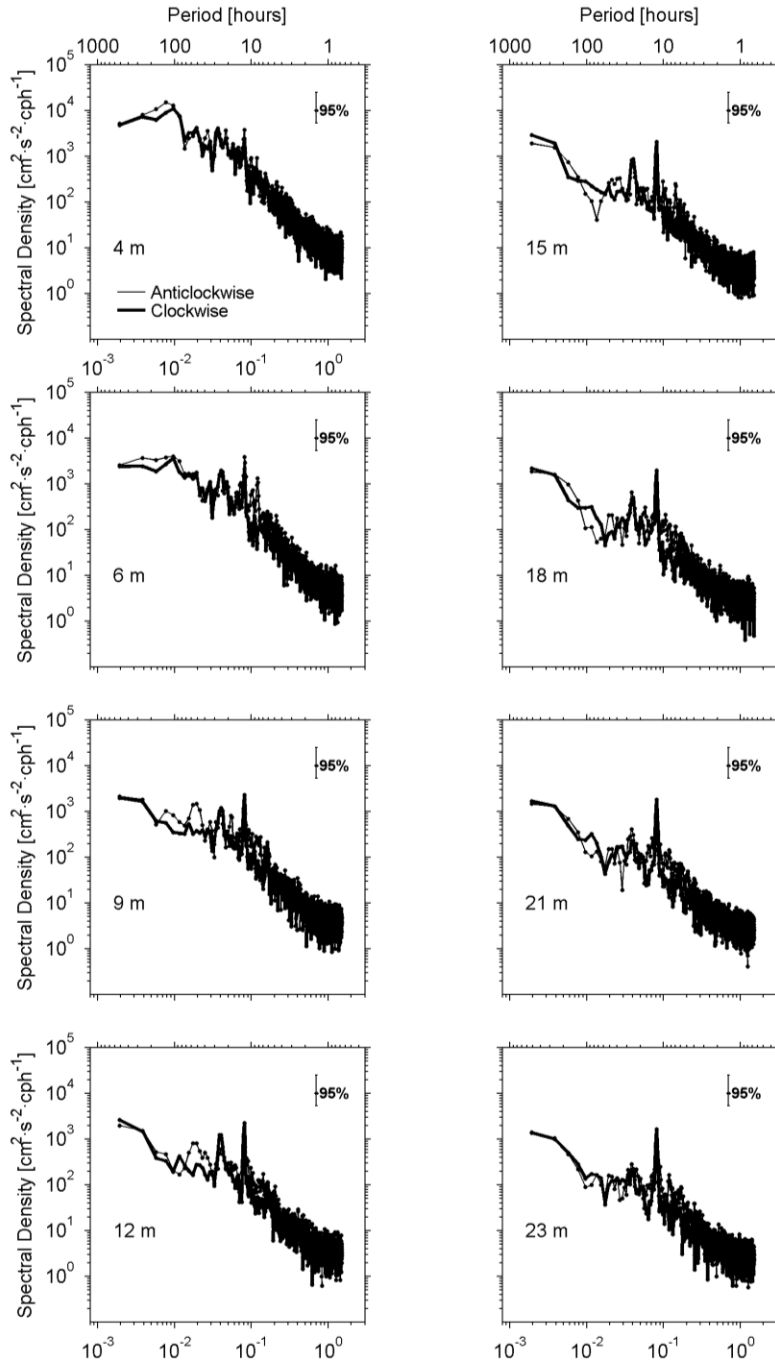
Figure 2.12. Clockwise and anticlockwise spectra of kinetic energy density. Spectral calculations were made with 14 degrees of freedom (~22 days). Location Gato.
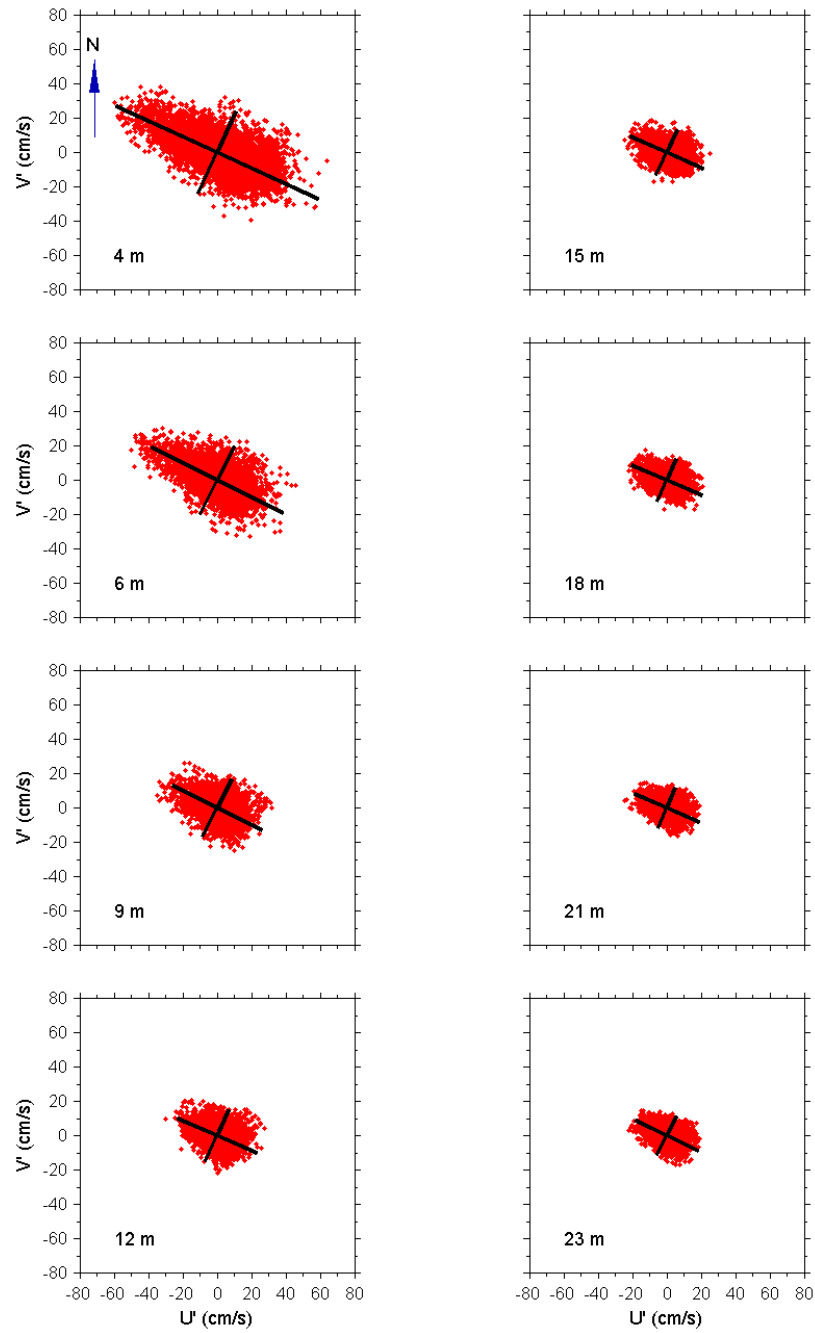
Figure 2.13. Scatter diagrams and principals axes. Arrow direction indicate north. The long of axes is 4 standard desviation. Location Gato.
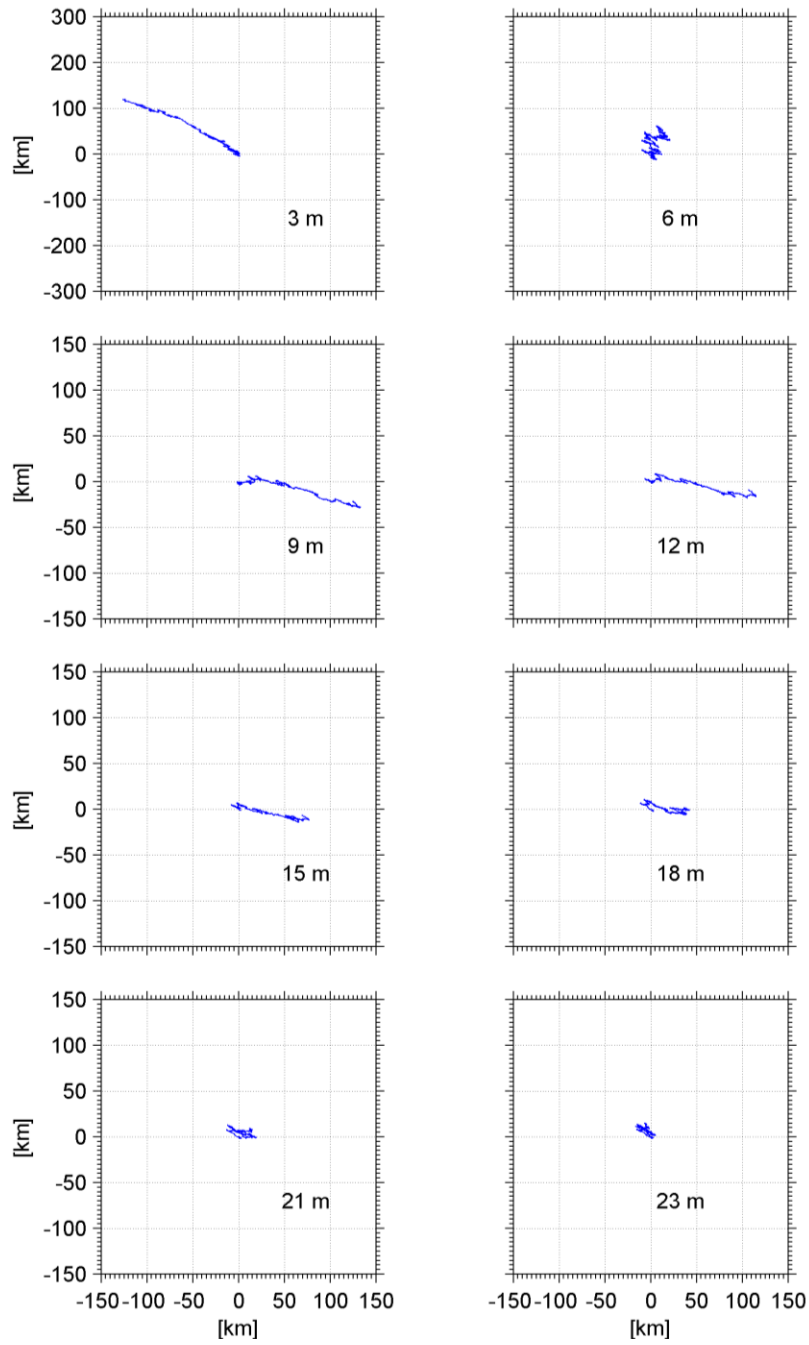
Figure 2.14. Progresive vector diagrams. The axes data no rotated. Location Gato.
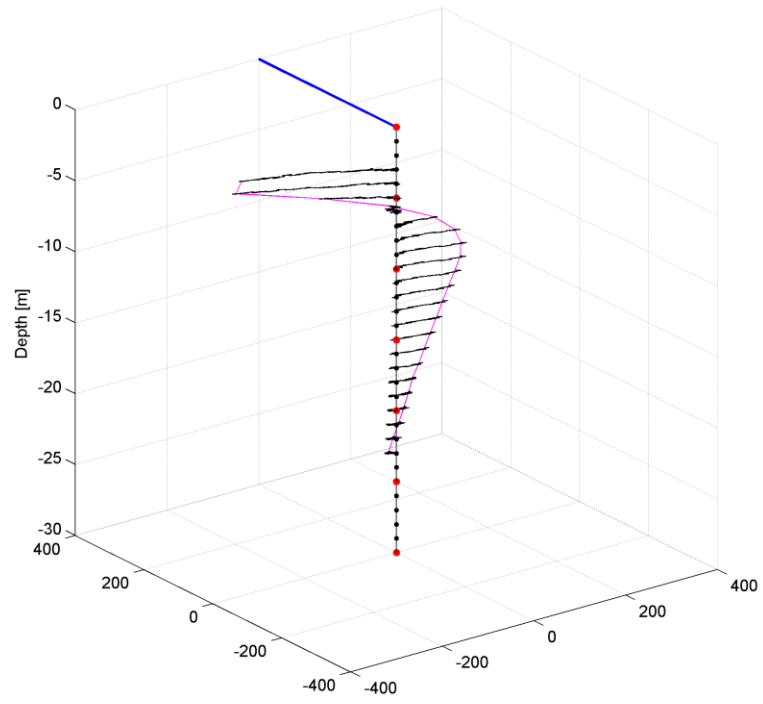
Figure 2.15. Progresive vector diagrams all depth. The line blue indicate to north. Axes data no rotated. Location Gato.

Table 2.1. Statistics of the current records at Gato. $\overline{|v|}$, $|v|_{max}$, $|v|_{std}$, $\overline{u}$, u', $\overline{v}$, v', $u'v'$, K_e and N are magnitude mean, magnitude maximum, standard deviation of magnitude, average, standard deviation and covariance of components u and v, kinetics energy and number of data.

Depth (m)	$\overline{|v|}$ (cm/s)	$|v|_{max}$ (cm/s)	$|v|_{std}$ (cm/s)	$\overline{u}$ (cm/s)	u' (cm/s)	$\overline{v}$ (cm/s)	v' (cm/s)	$u'v'$ (cm^2/s^2)	K_e (cm^2/s^2)	N
2	18.18	80.10	14.53	-4.18	21.37	0.57	8.19	-22.62	261.86	1720
3	17.63	81.20	12.28	4.80	19.66	-0.06	7.22	2.63	219.31	7954
4	14.51	70.80	10.72	4.46	16.19	-0.26	6.57	-2.35	152.72	10353
5	11.42	66.45	8.74	2.00	12.91	-0.37	6.01	-6.10	101.35	10661
6	9.68	54.47	7.17	-0.00	10.67	-0.46	5.56	-3.71	72.40	10720
7	8.51	45.42	5.97	-1.25	8.96	-0.46	5.10	-3.47	53.10	10787
8	7.86	39.11	5.23	-1.77	7.92	-0.43	4.80	-2.54	42.93	10820
9	7.42	35.22	4.84	-1.89	7.27	-0.46	4.66	-1.38	37.30	10855
10	7.10	33.08	4.55	-1.85	6.86	-0.49	4.51	-0.80	33.69	10850
11	6.79	31.25	4.27	-1.70	6.54	-0.51	4.31	-0.27	30.65	10859
12	6.53	30.21	4.08	-1.51	6.30	-0.49	4.12	0.23	28.35	10853
13	6.24	27.08	3.87	-1.34	6.06	-0.44	3.90	-0.06	25.93	10864
14	6.04	26.02	3.73	-1.18	5.89	-0.37	3.77	0.26	24.47	10869
15	5.90	26.33	3.62	-1.00	5.81	-0.32	3.62	0.02	23.42	10890
16	5.81	27.44	3.57	-0.82	5.79	-0.26	3.51	0.08	22.90	10895
17	5.72	25.79	3.50	-0.66	5.71	-0.23	3.44	0.24	22.24	10905
18	5.56	23.73	3.41	-0.49	5.57	-0.25	3.35	0.29	21.15	10903
19	5.42	22.71	3.31	-0.39	5.41	-0.27	3.31	0.45	20.09	10908
20	5.29	23.28	3.22	-0.26	5.26	-0.24	3.25	0.43	19.13	10914
21	5.21	24.72	3.14	-0.11	5.17	-0.20	3.20	0.24	18.48	10908
22	5.15	23.87	3.13	0.04	5.10	-0.20	3.19	-0.03	18.13	10911
23	5.10	22.58	3.11	0.17	5.06	-0.16	3.16	-0.45	17.82	10914
24	5.10	21.10	3.07	0.04	5.06	0.18	3.13	-0.91	17.70	8664
25	5.21	20.70	3.05	-1.48	4.85	0.80	3.18	-1.15	16.82	3201

Table 2.2. Constituents of the tidal currents at Gato (4 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	0.93	2.08	0.39	0.86	161.59	34.34	178.43	146.33	0.20
*MSF	0.0028	1.53	2.73	-0.26	0.70	178.93	19.77	13.97	103.59	0.31
*ALP1	0.0344	0.74	1.48	-0.03	0.57	166.27	30.28	342.62	141.95	0.25
*2Q1	0.0357	1.43	1.74	0.19	0.64	10.11	23.99	195.33	84.30	0.68
*Q1	0.0372	1.00	1.59	0.19	0.54	2.35	31.10	194.55	131.03	0.39
*O1	0.0387	1.90	1.90	0.31	0.61	175.49	20.43	104.32	64.29	1.00
*NO1	0.0403	0.69	1.26	-0.14	0.72	37.21	38.91	292.27	122.38	0.30
*K1	0.0418	0.41	1.35	0.01	0.53	178.47	30.67	5.83	188.98	0.09
*J1	0.0433	0.71	1.17	-0.10	1.10	107.33	100.77	198.14	86.32	0.36
*OO1	0.0448	1.08	1.31	0.23	0.43	2.37	24.03	161.93	87.64	0.68
*UPS1	0.0463	0.45	0.95	-0.09	0.78	114.30	64.09	67.53	131.71	0.22
*EPS2	0.0762	0.92	0.93	0.27	0.77	18.37	49.67	136.37	85.36	0.96
*MU2	0.0777	0.52	0.72	0.09	0.76	97.60	163.30	116.88	104.27	0.52
*N2	0.0790	1.09	1.17	0.12	0.75	26.16	40.90	272.87	61.29	0.88
*M2	0.0805	3.65	1.22	0.19	0.77	11.49	11.31	283.26	21.08	8.95
*L2	0.0820	0.64	0.78	-0.23	0.78	113.38	103.97	78.23	87.91	0.68
*S2	0.0833	0.95	0.99	0.48	0.72	25.07	58.63	276.26	92.63	0.92
*ETA2	0.0851	0.35	0.63	0.13	0.63	101.93	156.03	120.56	127.79	0.31
*MO3	0.1192	0.31	0.46	-0.21	0.45	63.38	128.18	201.34	125.98	0.45
*M3	0.1208	0.41	0.64	-0.08	0.46	5.55	79.42	202.59	125.44	0.41
*MK3	0.1223	0.65	0.65	0.03	0.53	20.02	51.47	353.66	65.35	1.00
*SK3	0.1251	0.41	0.55	0.02	0.49	43.37	79.52	51.15	103.88	0.57
*MN4	0.1595	0.32	0.36	0.02	0.37	107.10	114.51	327.31	111.49	0.80
*M4	0.1610	0.50	0.49	-0.12	0.40	144.49	67.83	325.38	72.76	1.01
*SN4	0.1623	0.25	0.40	0.14	0.37	42.78	98.21	79.35	144.32	0.41
*MS4	0.1638	0.59	0.43	0.19	0.44	130.90	62.50	60.51	60.57	1.84
*S4	0.1667	0.35	0.44	0.03	0.37	9.95	66.40	305.17	100.84	0.64
*2MK5	0.2028	0.37	0.28	-0.01	0.28	154.09	54.29	144.15	67.28	1.75
*2SK5	0.2084	0.20	0.25	0.02	0.23	53.14	98.39	125.48	115.20	0.62
*2MN6	0.2400	0.15	0.26	0.01	0.26	76.25	119.18	46.34	141.25	0.32
*M6	0.2415	0.18	0.26	0.02	0.27	135.87	113.07	90.95	116.68	0.49
*2MS6	0.2444	0.16	0.27	-0.03	0.25	37.75	111.46	166.11	129.52	0.35
*2SM6	0.2472	0.33	0.31	-0.02	0.30	5.27	58.41	187.57	77.12	1.12
*3MK7	0.2833	0.12	0.19	-0.06	0.18	25.76	124.86	175.11	164.54	0.37
*M8	0.3220	0.13	0.18	-0.07	0.16	9.82	105.09	74.02	145.29	0.50

Percent variance predicted = 5.7% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 2.3. Constituents of the tidal currents at Gato (6 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	0.84	1.57	0.15	0.62	158.79	30.99	135.54	126.60	0.28
*MSF	0.0028	1.90	2.03	-0.11	0.52	0.11	14.92	174.93	76.18	0.88
*ALP1	0.0344	0.87	1.23	0.06	0.39	173.28	25.93	335.73	88.47	0.50
*2Q1	0.0357	0.47	0.97	0.04	0.46	21.65	34.73	153.59	122.82	0.23
*Q1	0.0372	0.48	0.85	-0.08	0.43	162.98	36.12	79.64	130.10	0.32
*O1	0.0387	1.96	1.25	0.11	0.48	169.36	13.43	100.12	39.52	2.44
*NO1	0.0403	0.92	1.00	0.14	0.44	173.76	20.60	157.63	73.44	0.85
*K1	0.0418	1.24	1.18	0.03	0.45	174.69	16.54	175.26	62.55	1.10
*J1	0.0433	0.93	1.16	0.07	0.46	169.92	23.62	158.67	84.53	0.64
*OO1	0.0448	0.42	0.75	-0.06	0.30	14.97	31.39	201.82	123.37	0.31
*UPS1	0.0463	0.38	0.64	0.04	0.47	141.34	48.26	87.16	122.05	0.36
*EPS2	0.0762	0.36	0.70	0.22	0.72	51.27	105.57	151.95	167.04	0.26
*MU2	0.0777	0.41	0.72	0.31	0.69	151.32	103.89	188.22	145.88	0.33
*N2	0.0790	0.78	0.88	-0.00	0.73	159.40	64.15	116.67	86.32	0.79
*M2	0.0805	2.58	1.12	0.59	0.90	7.08	19.18	263.43	26.16	5.27
*L2	0.0820	0.51	0.69	-0.18	0.68	69.09	111.79	102.52	119.50	0.55
*S2	0.0833	1.37	0.88	0.73	0.78	12.18	57.50	257.14	69.78	2.42
*ETA2	0.0851	0.43	0.68	0.09	0.61	22.37	84.66	203.37	144.30	0.39
*MO3	0.1192	0.44	0.51	0.05	0.49	12.43	79.20	264.17	84.58	0.75
*M3	0.1208	0.36	0.52	-0.01	0.43	7.87	101.38	317.05	95.84	0.50
*MK3	0.1223	0.24	0.43	0.18	0.40	13.72	106.20	336.62	136.63	0.31
*SK3	0.1251	0.39	0.47	0.08	0.49	29.25	85.29	75.52	94.75	0.67
*MN4	0.1595	0.23	0.32	-0.11	0.30	44.01	87.74	157.97	113.45	0.51
*M4	0.1610	0.43	0.31	-0.35	0.27	179.65	110.38	7.50	128.86	1.99
*SN4	0.1623	0.24	0.30	-0.01	0.28	67.96	86.43	91.13	83.84	0.65
*MS4	0.1638	0.43	0.32	-0.34	0.31	166.65	100.94	26.54	102.25	1.79
*S4	0.1667	0.26	0.30	0.06	0.30	57.60	102.64	45.71	83.99	0.75
*2MK5	0.2028	0.18	0.29	-0.02	0.19	27.97	75.06	299.04	118.45	0.39
*2SK5	0.2084	0.11	0.25	-0.03	0.18	23.98	59.52	122.95	173.30	0.18
*2MN6	0.2400	0.23	0.22	0.07	0.21	94.77	86.40	130.68	87.69	1.07
*M6	0.2415	0.12	0.21	0.05	0.20	117.51	116.53	266.24	153.49	0.32
*2MS6	0.2444	0.23	0.18	0.11	0.24	60.35	87.54	202.77	99.69	1.62
*2SM6	0.2472	0.18	0.21	-0.02	0.21	131.20	85.57	49.92	99.64	0.72
*3MK7	0.2833	0.10	0.14	0.03	0.15	130.42	110.39	34.67	127.52	0.53
*M8	0.3220	0.14	0.11	0.03	0.14	68.76	74.86	193.18	66.61	1.73

Percent variance predicted = 9.0% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 2.4. Constituents of the tidal currents at Gato (9 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	0.92	1.89	-0.27	0.69	160.98	32.29	38.02	156.36	0.24
*MSF	0.0028	2.26	2.31	-0.05	0.43	0.30	10.89	166.11	63.01	0.96
*ALP1	0.0344	0.49	0.59	0.09	0.46	27.14	45.70	165.18	102.96	0.68
*2Q1	0.0357	0.30	0.51	-0.16	0.41	138.10	77.36	155.94	161.55	0.35
*Q1	0.0372	0.54	0.70	-0.03	0.40	166.75	39.72	75.72	93.49	0.60
*O1	0.0387	1.38	0.78	-0.19	0.41	173.68	16.86	93.87	36.47	3.15
*NO1	0.0403	0.43	0.58	0.14	0.33	162.77	45.54	145.11	97.92	0.54
*K1	0.0418	1.04	0.86	-0.42	0.39	10.04	35.99	332.46	66.16	1.45
*J1	0.0433	0.86	0.97	0.02	0.40	5.01	29.01	317.81	64.19	0.79
*OO1	0.0448	0.18	0.44	0.04	0.30	135.75	62.02	100.23	178.80	0.16
*UPS1	0.0463	0.28	0.45	-0.01	0.41	57.57	88.02	193.54	111.83	0.38
*EPS2	0.0762	0.44	0.62	0.18	0.48	22.34	90.51	262.50	110.92	0.50
*MU2	0.0777	0.46	0.51	0.13	0.55	131.43	94.20	67.37	105.88	0.80
*N2	0.0790	0.69	0.64	-0.21	0.59	167.43	61.47	83.85	82.28	1.15
*M2	0.0805	2.23	0.66	0.39	0.59	160.13	15.75	90.28	20.83	11.59
*L2	0.0820	0.30	0.46	-0.21	0.47	102.20	142.51	186.54	121.82	0.42
*S2	0.0833	0.82	0.58	0.18	0.57	156.59	44.61	70.63	54.63	2.02
*ETA2	0.0851	0.47	0.47	0.02	0.48	43.67	86.40	219.34	92.26	0.97
*MO3	0.1192	0.07	0.27	0.06	0.23	42.51	148.85	10.59	216.53	0.07
*M3	0.1208	0.17	0.29	-0.09	0.28	22.94	124.20	68.37	141.73	0.34
*MK3	0.1223	0.30	0.28	0.12	0.31	174.66	94.21	321.02	98.63	1.13
*SK3	0.1251	0.36	0.30	0.13	0.34	82.08	68.58	74.16	74.17	1.43
*MN4	0.1595	0.22	0.22	0.00	0.25	48.93	84.36	151.51	90.19	0.98
*M4	0.1610	0.49	0.25	-0.26	0.28	104.94	57.47	121.29	52.51	4.07
*SN4	0.1623	0.23	0.25	-0.01	0.25	166.58	73.90	42.17	74.70	0.87
*MS4	0.1638	0.29	0.27	-0.21	0.26	147.63	90.34	81.43	101.96	1.18
*S4	0.1667	0.27	0.29	0.01	0.22	4.22	69.06	107.33	68.83	0.85
*2MK5	0.2028	0.21	0.24	0.01	0.19	6.22	64.55	299.78	84.96	0.80
*2SK5	0.2084	0.08	0.19	0.04	0.16	23.34	89.55	48.64	183.43	0.20
*2MN6	0.2400	0.15	0.17	-0.00	0.17	177.56	78.76	267.16	83.14	0.85
*M6	0.2415	0.17	0.16	0.04	0.17	21.58	77.19	116.99	71.33	1.13
*2MS6	0.2444	0.21	0.15	0.04	0.16	59.61	57.58	220.56	58.41	2.02
*2SM6	0.2472	0.17	0.15	0.08	0.13	49.21	90.94	163.71	86.70	1.22
*3MK7	0.2833	0.13	0.13	0.03	0.15	8.80	88.97	132.66	82.18	0.95
*M8	0.3220	0.11	0.10	-0.02	0.10	28.55	76.53	114.45	74.80	1.36

Percent variance predicted = 12.9% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 2.5. Constituents of the tidal currents at Gato (12 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	1.16	1.77	-0.06	0.42	172.00	15.24	8.33	116.21	0.43
*MSF	0.0028	2.38	2.31	-0.19	0.43	3.96	10.28	187.10	57.59	1.06
*ALP1	0.0344	0.32	0.53	-0.01	0.38	147.76	62.80	231.06	108.08	0.37
*2Q1	0.0357	0.14	0.42	0.05	0.33	98.97	106.76	153.10	174.82	0.10
*Q1	0.0372	0.36	0.54	0.04	0.35	169.96	51.14	35.43	116.08	0.44
*O1	0.0387	1.28	0.81	-0.10	0.38	2.50	17.06	270.25	35.93	2.48
*NO1	0.0403	0.29	0.39	0.08	0.32	44.30	68.24	330.60	113.68	0.58
*K1	0.0418	0.87	0.68	-0.28	0.43	11.90	31.75	336.46	51.30	1.63
*J1	0.0433	0.77	0.72	-0.05	0.44	19.21	34.67	315.10	56.62	1.14
*OO1	0.0448	0.23	0.40	-0.14	0.34	25.45	68.35	213.20	169.94	0.34
*UPS1	0.0463	0.18	0.38	-0.13	0.31	67.89	111.81	136.19	127.74	0.23
*EPS2	0.0762	0.45	0.48	0.23	0.48	12.90	93.73	260.97	91.04	0.90
*MU2	0.0777	0.52	0.48	0.14	0.49	163.32	76.57	44.64	91.27	1.16
*N2	0.0790	0.63	0.50	-0.38	0.46	179.12	76.37	84.17	75.60	1.60
*M2	0.0805	1.90	0.56	-0.31	0.58	166.23	18.20	89.98	18.56	11.47
*L2	0.0820	0.33	0.47	-0.15	0.44	61.65	112.92	283.28	116.52	0.48
*S2	0.0833	0.74	0.47	0.03	0.54	160.52	46.04	95.39	48.89	2.51
*ETA2	0.0851	0.16	0.38	-0.06	0.35	16.27	115.09	258.95	172.34	0.18
*MO3	0.1192	0.12	0.20	-0.00	0.18	159.69	124.38	238.89	128.12	0.37
*M3	0.1208	0.22	0.27	0.09	0.22	71.17	82.31	347.04	95.07	0.70
*MK3	0.1223	0.16	0.21	0.12	0.22	14.71	128.45	152.63	122.00	0.54
*SK3	0.1251	0.05	0.18	-0.02	0.20	103.08	106.58	168.20	225.14	0.07
*MN4	0.1595	0.31	0.24	-0.05	0.24	56.35	56.51	135.82	55.59	1.78
*M4	0.1610	0.33	0.23	-0.14	0.20	88.02	63.05	137.33	60.25	2.03
*SN4	0.1623	0.18	0.19	-0.14	0.21	68.63	137.46	157.92	133.76	0.82
*MS4	0.1638	0.31	0.21	-0.10	0.25	85.72	65.64	147.32	53.22	2.20
*S4	0.1667	0.32	0.27	0.11	0.23	26.41	55.21	172.07	62.37	1.35
*2MK5	0.2028	0.08	0.15	0.04	0.15	91.36	152.00	171.31	161.39	0.26
*2SK5	0.2084	0.05	0.16	0.00	0.17	117.29	116.31	191.28	163.61	0.11
*2MN6	0.2400	0.13	0.13	0.04	0.11	178.81	77.15	298.97	75.03	1.02
*M6	0.2415	0.19	0.14	0.03	0.15	32.63	58.33	176.96	53.20	1.84
*2MS6	0.2444	0.17	0.14	-0.01	0.12	35.01	51.88	201.61	62.64	1.47
*2SM6	0.2472	0.09	0.12	0.06	0.11	62.44	113.98	149.48	129.44	0.61
*3MK7	0.2833	0.09	0.11	0.01	0.11	179.84	110.71	293.93	153.87	0.74
*M8	0.3220	0.04	0.07	-0.00	0.08	153.56	121.61	231.82	145.04	0.27

Percent variance predicted = 14.9% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 2.6. Constituents of the tidal currents at Gato (15 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	1.15	1.72	-0.04	0.46	178.72	16.60	26.31	127.06	0.44
*MSF	0.0028	2.32	1.96	-0.21	0.43	0.26	9.98	205.71	57.17	1.40
*ALP1	0.0344	0.28	0.47	0.13	0.29	170.38	49.84	245.21	128.27	0.36
*2Q1	0.0357	0.23	0.44	0.08	0.30	3.92	44.95	50.86	136.65	0.28
*Q1	0.0372	0.32	0.41	0.05	0.32	145.16	54.86	40.78	92.21	0.62
*O1	0.0387	1.23	0.61	0.03	0.30	11.66	14.74	271.08	32.40	4.03
*NO1	0.0403	0.20	0.42	0.03	0.21	177.18	42.72	101.83	135.66	0.23
*K1	0.0418	0.67	0.58	-0.26	0.28	177.64	33.92	175.18	60.78	1.34
*J1	0.0433	0.42	0.53	-0.07	0.29	0.17	34.13	327.45	95.16	0.62
*OO1	0.0448	0.25	0.34	-0.06	0.19	169.55	42.22	37.03	103.10	0.56
*UPS1	0.0463	0.22	0.31	0.04	0.32	125.45	77.61	73.56	135.54	0.50
*EPS2	0.0762	0.46	0.41	0.12	0.39	133.56	65.28	98.34	74.47	1.29
*MU2	0.0777	0.31	0.35	0.09	0.30	16.98	81.85	199.44	85.91	0.79
*N2	0.0790	0.71	0.42	-0.38	0.36	167.26	46.38	93.65	60.19	2.91
*M2	0.0805	1.87	0.48	-0.85	0.42	177.03	15.50	90.51	21.28	14.86
*L2	0.0820	0.31	0.36	-0.08	0.32	10.20	73.63	11.06	97.89	0.70
*S2	0.0833	0.83	0.51	-0.18	0.40	164.78	28.37	106.27	35.53	2.65
*ETA2	0.0851	0.26	0.31	0.20	0.30	132.39	112.11	29.80	132.33	0.69
*MO3	0.1192	0.16	0.19	0.11	0.19	31.83	108.00	134.96	118.69	0.64
*M3	0.1208	0.18	0.19	0.10	0.20	14.14	103.03	0.04	103.37	0.83
*MK3	0.1223	0.24	0.23	0.07	0.20	158.97	70.28	320.61	69.63	1.08
*SK3	0.1251	0.08	0.15	0.05	0.16	178.61	119.35	348.53	148.48	0.29
*MN4	0.1595	0.22	0.20	-0.03	0.21	105.59	77.23	86.38	67.67	1.16
*M4	0.1610	0.33	0.21	-0.08	0.22	85.54	48.46	151.07	40.59	2.41
*SN4	0.1623	0.22	0.18	-0.05	0.16	76.99	70.01	182.31	78.13	1.47
*MS4	0.1638	0.28	0.19	-0.06	0.21	76.80	49.15	183.50	53.50	2.21
*S4	0.1667	0.27	0.19	0.08	0.18	39.78	58.77	209.42	56.08	1.93
*2MK5	0.2028	0.04	0.13	0.04	0.12	89.72	127.07	218.95	203.31	0.11
*2SK5	0.2084	0.08	0.12	-0.00	0.14	6.45	118.51	313.88	132.28	0.43
*2MN6	0.2400	0.13	0.14	-0.01	0.12	172.53	72.19	293.02	75.89	0.93
*M6	0.2415	0.12	0.13	0.04	0.15	35.18	79.81	190.26	87.35	0.96
*2MS6	0.2444	0.14	0.13	-0.07	0.13	40.76	88.28	254.22	83.83	1.23
*2SM6	0.2472	0.15	0.14	0.03	0.12	19.53	79.93	109.33	72.93	1.09
*3MK7	0.2833	0.12	0.11	0.05	0.10	132.97	86.72	275.99	85.31	1.02
*M8	0.3220	0.10	0.10	0.01	0.09	34.22	74.24	149.39	67.75	0.96

Percent variance predicted = 17.2% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 2.7. Constituents of the tidal currents at Gato (18 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	1.20	1.73	-0.15	0.50	8.65	18.62	219.15	100.29	0.48
*MSF	0.0028	2.34	1.78	-0.09	0.46	179.03	12.04	41.23	50.32	1.73
*ALP1	0.0344	0.24	0.29	-0.02	0.32	124.26	88.11	258.09	97.41	0.69
*2Q1	0.0357	0.28	0.44	-0.09	0.26	175.96	54.80	231.15	148.99	0.40
*Q1	0.0372	0.24	0.36	-0.07	0.28	142.15	60.37	28.78	96.80	0.47
*O1	0.0387	1.10	0.49	0.20	0.27	6.51	15.65	268.39	31.18	5.03
*NO1	0.0403	0.24	0.31	0.02	0.23	155.32	55.92	54.36	108.01	0.60
*K1	0.0418	0.49	0.44	-0.04	0.27	15.39	30.54	344.50	67.67	1.19
*J1	0.0433	0.28	0.41	0.14	0.23	162.99	64.10	153.92	104.14	0.47
*OO1	0.0448	0.28	0.34	0.03	0.20	19.31	40.17	222.72	67.40	0.70
*UPS1	0.0463	0.15	0.26	0.06	0.20	52.25	76.70	291.36	120.57	0.33
*EPS2	0.0762	0.46	0.43	0.05	0.40	116.66	66.31	128.59	62.68	1.12
*MU2	0.0777	0.35	0.43	0.03	0.36	57.42	81.38	201.85	80.02	0.69
*N2	0.0790	0.69	0.42	-0.18	0.42	172.41	37.37	100.46	51.43	2.78
*M2	0.0805	2.14	0.43	-0.86	0.46	174.59	13.34	98.22	15.56	24.52
*L2	0.0820	0.38	0.37	-0.03	0.40	11.65	65.69	9.80	79.70	1.04
*S2	0.0833	0.87	0.42	-0.29	0.39	161.80	33.70	120.04	30.73	4.31
*ETA2	0.0851	0.34	0.29	0.14	0.38	122.57	80.64	15.67	87.21	1.42
*MO3	0.1192	0.12	0.20	0.11	0.19	52.39	122.83	82.84	160.36	0.36
*M3	0.1208	0.22	0.24	0.07	0.20	152.12	80.08	185.33	86.62	0.87
*MK3	0.1223	0.12	0.18	0.01	0.16	145.67	89.78	324.46	121.00	0.44
*SK3	0.1251	0.09	0.17	-0.03	0.18	163.90	91.62	6.79	150.56	0.26
*MN4	0.1595	0.19	0.18	0.09	0.18	95.18	95.44	74.24	88.20	1.11
*M4	0.1610	0.21	0.16	-0.05	0.19	86.81	75.86	170.28	70.43	1.69
*SN4	0.1623	0.15	0.15	-0.02	0.16	71.79	87.94	235.82	92.73	0.91
*MS4	0.1638	0.38	0.18	0.07	0.21	102.02	38.79	194.54	32.57	4.34
*S4	0.1667	0.21	0.18	0.04	0.17	65.58	68.75	210.55	53.15	1.27
*2MK5	0.2028	0.06	0.14	0.03	0.11	140.87	120.04	16.09	164.54	0.21
*2SK5	0.2084	0.15	0.12	0.03	0.14	66.92	65.28	340.32	69.58	1.46
*2MN6	0.2400	0.15	0.13	0.02	0.13	172.12	65.70	312.89	75.10	1.26
*M6	0.2415	0.19	0.14	0.05	0.12	38.78	51.67	182.69	52.75	1.80
*2MS6	0.2444	0.13	0.12	-0.02	0.11	5.58	68.31	266.03	71.61	1.23
*2SM6	0.2472	0.04	0.10	-0.01	0.09	15.00	121.94	129.19	193.86	0.15
*3MK7	0.2833	0.06	0.09	0.03	0.08	112.42	100.48	279.92	124.57	0.48
*M8	0.3220	0.10	0.10	-0.02	0.08	51.28	58.10	175.16	54.13	1.09

Percent variance predicted = 19.8% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidel current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 2.8. Constituents of the tidal currents at Gato (21 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	0.99	1.20	-0.20	0.48	9.74	27.11	213.46	92.89	0.68
*MSF	0.0028	2.24	1.62	-0.05	0.49	0.32	10.53	231.37	41.87	1.92
*ALP1	0.0344	0.17	0.27	-0.03	0.25	127.01	85.85	263.58	117.42	0.40
*2Q1	0.0357	0.33	0.41	-0.05	0.26	179.16	49.11	233.11	105.39	0.66
*Q1	0.0372	0.20	0.33	-0.05	0.24	164.14	56.30	29.48	122.58	0.38
*O1	0.0387	0.94	0.45	0.03	0.23	176.99	16.22	82.34	25.37	4.25
*NO1	0.0403	0.19	0.28	0.01	0.19	8.27	50.00	233.73	112.80	0.47
*K1	0.0418	0.33	0.38	0.14	0.25	6.66	45.79	305.67	94.10	0.75
*J1	0.0433	0.37	0.34	0.16	0.27	9.04	48.78	338.97	97.05	1.18
*OO1	0.0448	0.20	0.22	0.13	0.25	59.21	112.52	226.21	116.90	0.77
*UPS1	0.0463	0.11	0.20	0.06	0.19	84.03	186.75	282.78	133.57	0.31
*EPS2	0.0762	0.45	0.38	0.02	0.30	83.32	49.13	151.91	54.92	1.42
*MU2	0.0777	0.34	0.32	0.10	0.30	64.68	71.77	194.40	78.26	1.12
*N2	0.0790	0.72	0.32	-0.23	0.36	171.55	35.59	94.12	34.47	4.90
*M2	0.0805	2.22	0.31	-0.95	0.38	175.38	14.47	101.40	14.53	51.17
*L2	0.0820	0.24	0.31	0.09	0.32	16.74	112.68	21.49	115.57	0.58
*S2	0.0833	1.20	0.37	-0.31	0.36	163.46	20.25	129.05	17.37	10.37
*ETA2	0.0851	0.27	0.27	0.07	0.29	142.93	77.49	42.95	81.63	0.96
*MO3	0.1192	0.09	0.18	0.07	0.17	98.77	167.08	166.96	146.67	0.23
*M3	0.1208	0.13	0.20	-0.01	0.18	166.03	75.81	221.51	122.72	0.46
*MK3	0.1223	0.23	0.20	0.08	0.22	120.21	83.40	43.35	72.83	1.22
*SK3	0.1251	0.06	0.17	-0.00	0.13	95.26	161.10	263.45	178.96	0.11
*MN4	0.1595	0.17	0.16	0.06	0.16	52.51	80.80	31.61	89.35	1.18
*M4	0.1610	0.16	0.16	0.00	0.18	97.22	86.86	176.95	67.68	1.07
*SN4	0.1623	0.22	0.17	0.07	0.18	59.59	71.78	274.28	65.89	1.61
*MS4	0.1638	0.27	0.17	0.04	0.19	64.71	56.67	214.52	49.91	2.59
*S4	0.1667	0.14	0.14	0.02	0.15	166.53	76.75	10.94	106.63	1.03
*2MK5	0.2028	0.07	0.12	-0.01	0.12	146.58	111.23	67.13	145.63	0.37
*2SK5	0.2084	0.15	0.14	0.02	0.13	39.76	68.32	7.25	65.87	1.17
*2MN6	0.2400	0.14	0.12	0.06	0.11	164.58	81.17	295.12	82.32	1.47
*M6	0.2415	0.13	0.13	0.04	0.12	45.36	72.69	190.95	88.88	1.09
*2MS6	0.2444	0.09	0.12	-0.03	0.11	30.50	94.38	234.67	118.50	0.63
*2SM6	0.2472	0.05	0.09	0.00	0.10	91.52	147.25	221.56	158.07	0.31
*3MK7	0.2833	0.08	0.09	0.03	0.08	141.72	91.23	255.94	106.61	0.70
*M8	0.3220	0.08	0.09	0.03	0.08	32.56	78.13	180.38	84.58	0.88

Percent variance predicted = 22.0% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 2.9. Constituents of the tidal currents at Gato (23 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (°)	Error (°)	Phase (°)	Error (°)	SNR
*MM	0.0015	1.05	1.27	-0.21	0.45	11.85	24.48	207.24	83.36	0.68
*MSF	0.0028	2.18	1.22	-0.04	0.34	178.68	9.63	57.48	38.41	3.21
*ALP1	0.0344	0.19	0.30	-0.11	0.29	118.27	121.85	305.85	106.26	0.41
*2Q1	0.0357	0.24	0.32	-0.04	0.20	169.57	41.47	223.85	122.86	0.59
*Q1	0.0372	0.22	0.36	-0.06	0.21	170.44	53.14	30.35	112.94	0.36
*O1	0.0387	0.84	0.48	0.01	0.21	170.72	14.99	80.56	28.92	3.08
*NO1	0.0403	0.24	0.27	-0.06	0.22	33.84	57.47	206.16	90.24	0.77
*K1	0.0418	0.35	0.35	0.03	0.19	169.64	37.41	100.56	82.92	1.03
*J1	0.0433	0.36	0.33	0.14	0.23	1.29	36.92	320.25	80.67	1.23
*OO1	0.0448	0.17	0.22	0.08	0.18	34.85	64.98	212.79	104.45	0.61
*UPS1	0.0463	0.09	0.22	0.05	0.16	169.70	54.83	342.46	159.61	0.17
*EPS2	0.0762	0.32	0.32	-0.08	0.29	60.64	81.89	175.39	80.69	0.98
*MU2	0.0777	0.42	0.30	0.18	0.30	69.99	63.44	186.77	54.90	1.97
*N2	0.0790	0.63	0.34	-0.21	0.39	167.20	40.01	97.33	46.18	3.46
*M2	0.0805	2.20	0.38	-1.01	0.35	169.97	12.70	108.79	15.07	32.86
*L2	0.0820	0.12	0.27	0.10	0.26	53.43	150.19	53.18	178.38	0.21
*S2	0.0833	1.40	0.33	-0.32	0.38	161.70	14.73	133.02	14.97	18.10
*ETA2	0.0851	0.08	0.23	0.02	0.21	165.28	131.35	75.23	192.65	0.12
*MO3	0.1192	0.14	0.17	0.06	0.19	102.09	125.44	184.43	105.94	0.65
*M3	0.1208	0.22	0.24	0.05	0.20	149.51	69.17	216.08	91.08	0.81
*MK3	0.1223	0.23	0.23	0.18	0.23	106.20	130.19	58.42	98.31	1.05
*SK3	0.1251	0.13	0.19	0.05	0.19	97.33	132.05	212.49	108.48	0.51
*MN4	0.1595	0.19	0.16	-0.07	0.18	65.44	72.34	14.72	72.66	1.34
*M4	0.1610	0.08	0.16	-0.05	0.16	59.73	123.09	209.34	148.05	0.26
*SN4	0.1623	0.20	0.18	0.11	0.17	53.53	93.22	290.76	93.18	1.13
*MS4	0.1638	0.18	0.17	0.02	0.18	75.48	76.50	218.86	67.52	1.17
*S4	0.1667	0.14	0.17	0.08	0.16	171.86	108.56	56.08	161.04	0.74
*2MK5	0.2028	0.07	0.10	0.00	0.12	124.46	90.94	112.87	130.04	0.52
*2SK5	0.2084	0.09	0.11	-0.04	0.12	58.71	84.48	339.25	119.54	0.61
*2MN6	0.2400	0.14	0.12	0.08	0.12	154.58	77.12	283.91	85.14	1.38
*M6	0.2415	0.18	0.14	0.09	0.11	62.92	62.98	192.21	72.04	1.62
*2MS6	0.2444	0.13	0.11	0.01	0.13	7.75	71.83	260.95	81.25	1.46
*2SM6	0.2472	0.03	0.09	-0.01	0.08	11.03	151.67	105.01	203.61	0.08
*3MK7	0.2833	0.07	0.08	0.02	0.08	148.12	95.60	281.59	125.97	0.64
*M8	0.3220	0.07	0.08	0.03	0.08	37.46	94.42	203.40	96.22	0.78

Percent variance predicted = 22.8% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

3) ADCP LR 75 Khz
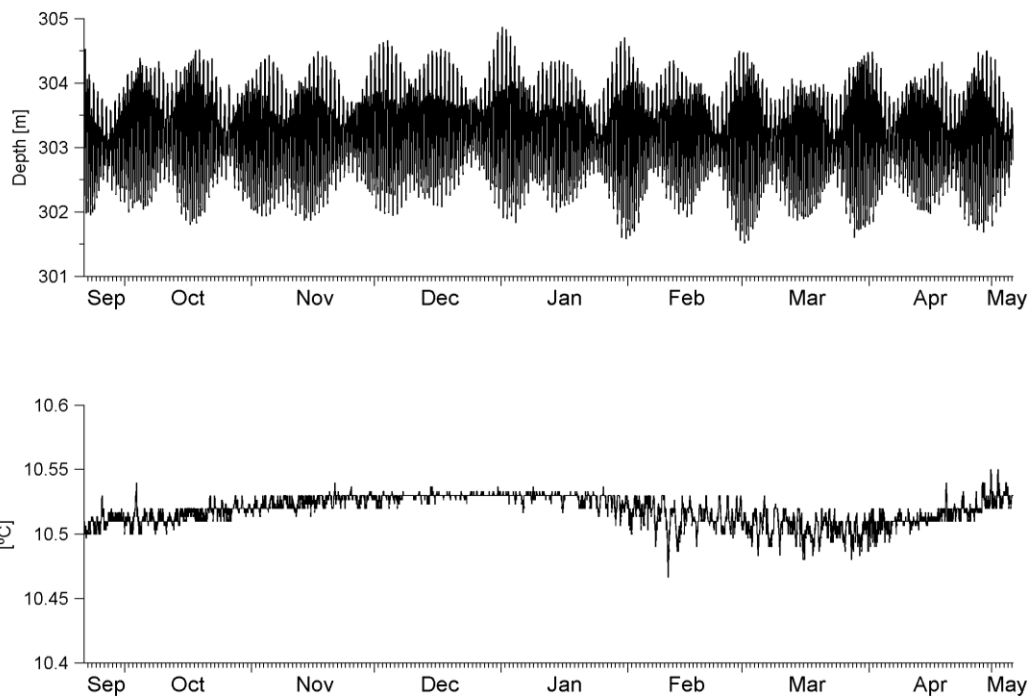
Figure 3.1. Depth and temperature ADCP. Hourly data. Location Gato.
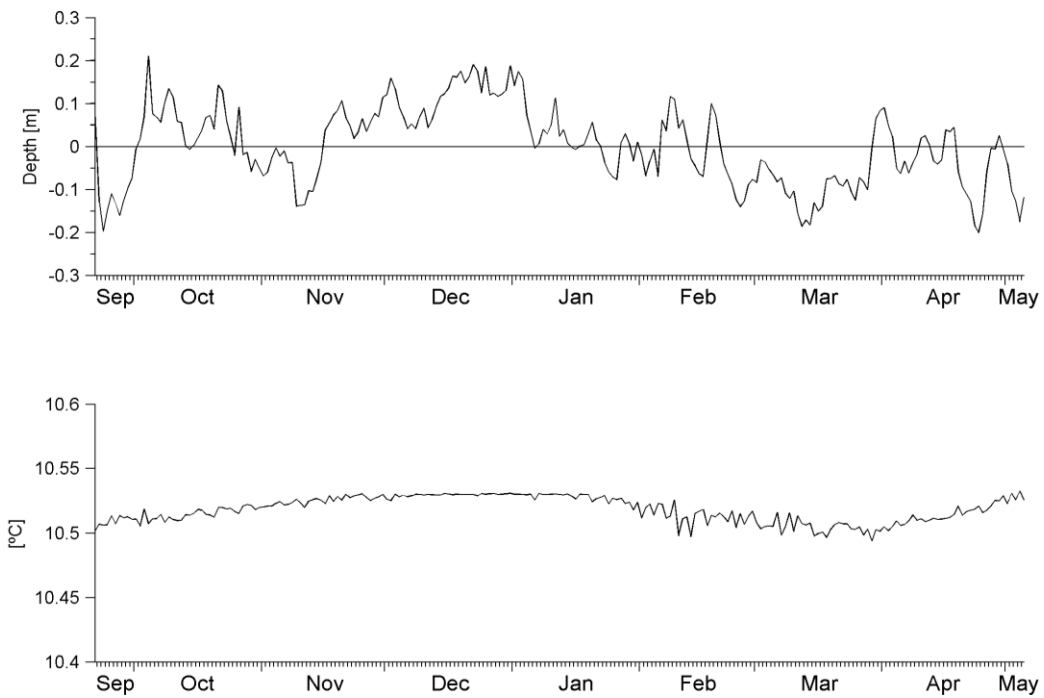
Figure 3.2. Depth anomaly and temperature ADCP. Daily data. Location Gato.
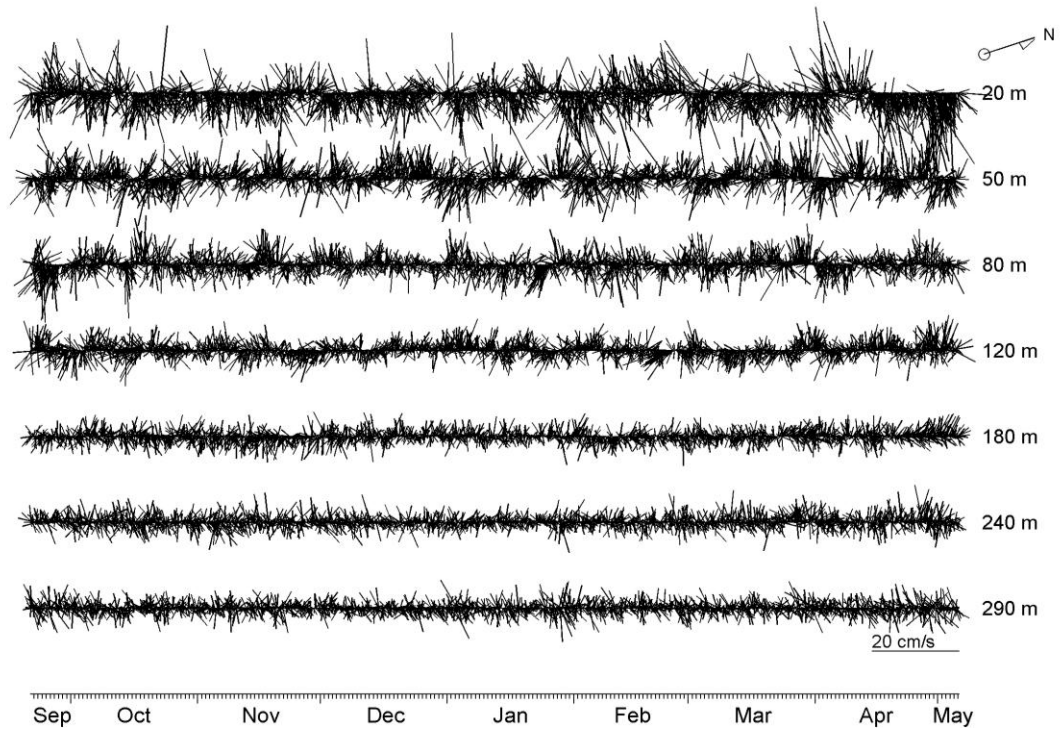
Figure 3.3. Currents vector. Data resampled each two hours. Location Gato.
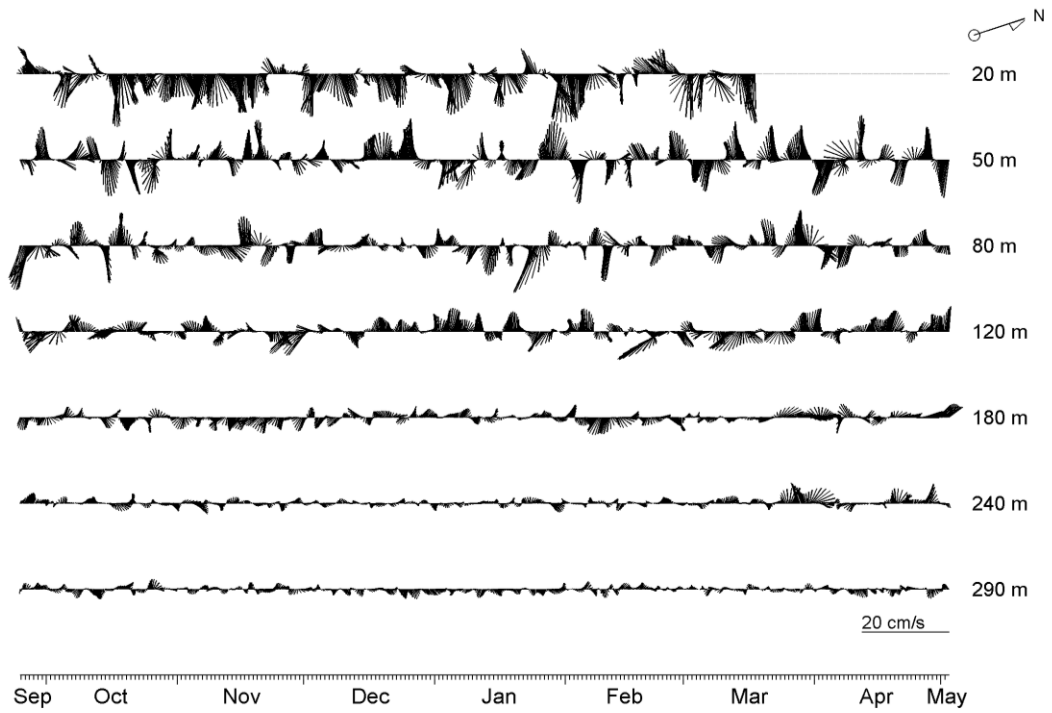
Figure 3.4. Currents vector. Flitered data and resampled each six hours. Location Gato.
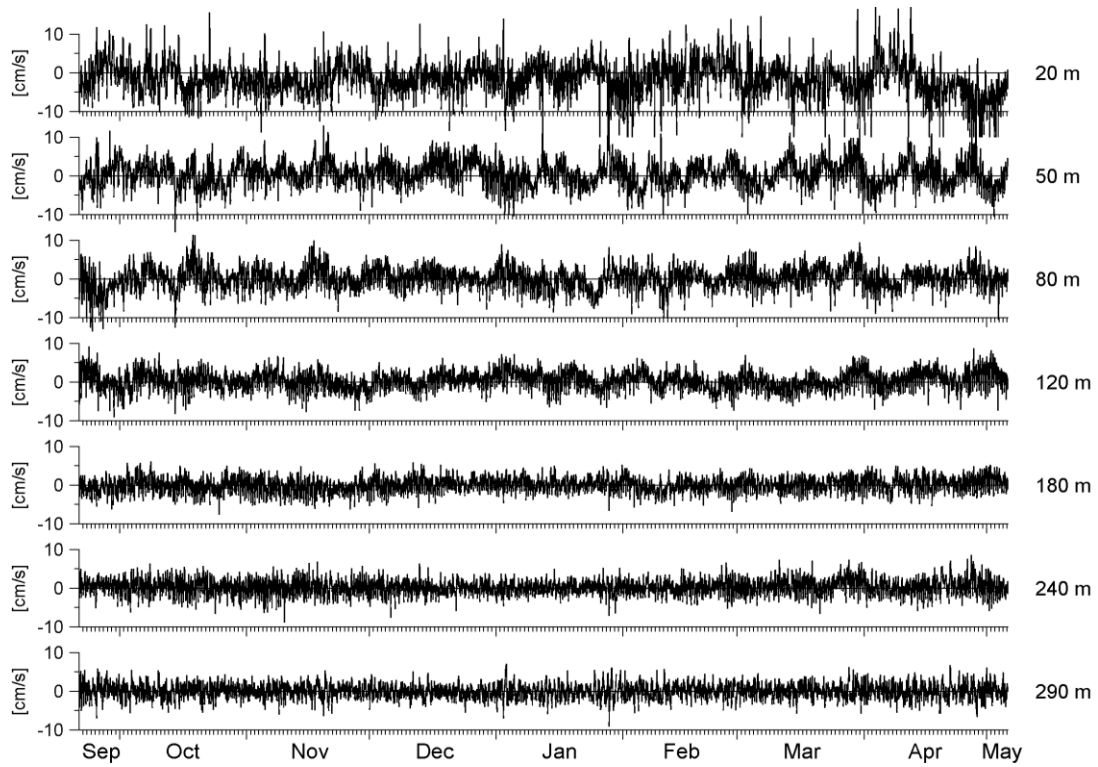
Figure 3.5. Components U (along fjord). Hourly data. Location Gato.
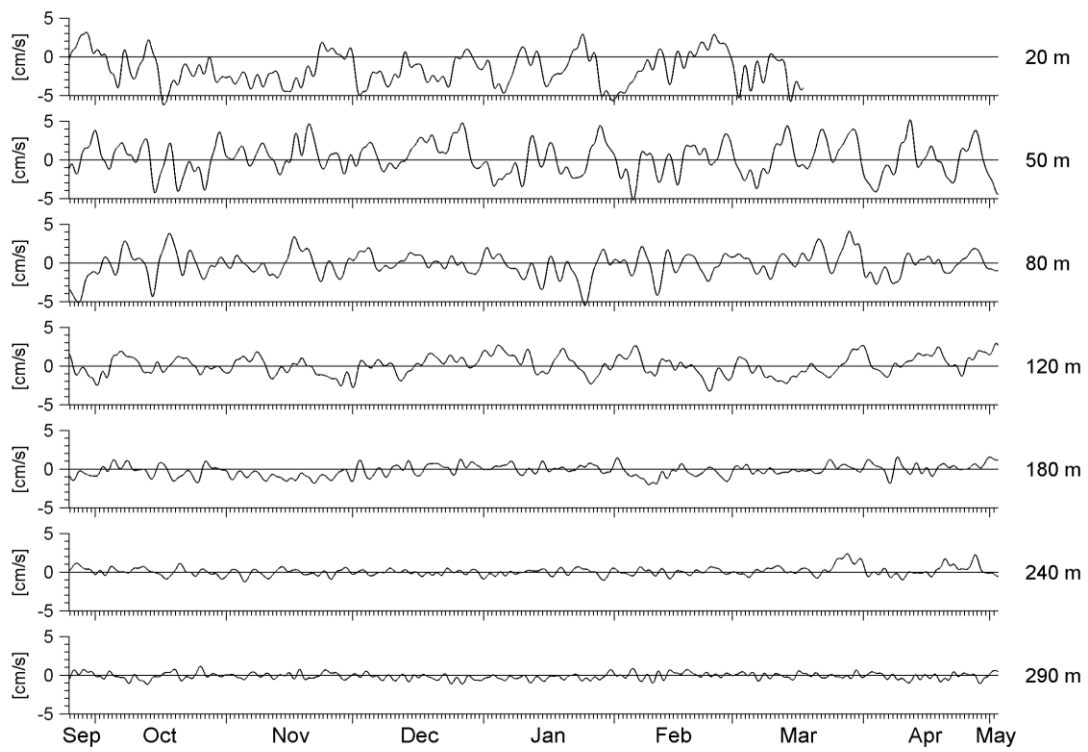
Figure 3.6. Components U (along fjord). Filtered data. Location Gato.
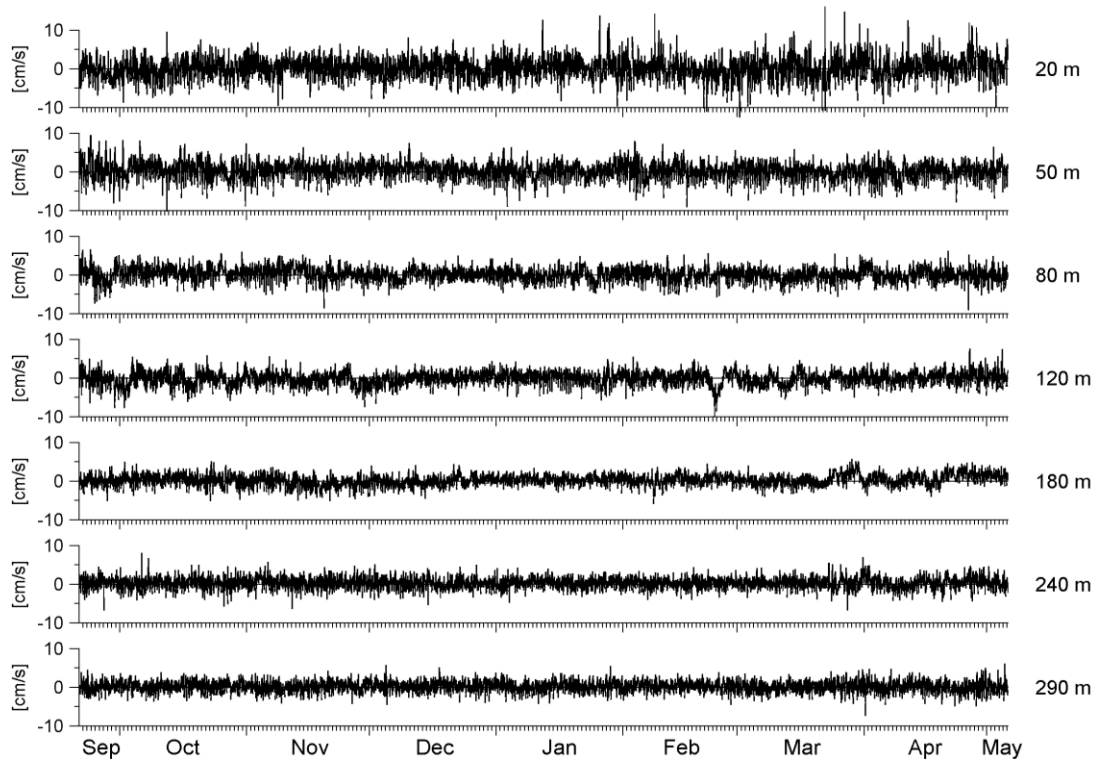
Figure 3.7. Components V (cross fjord). Hourly data. Location Gato.
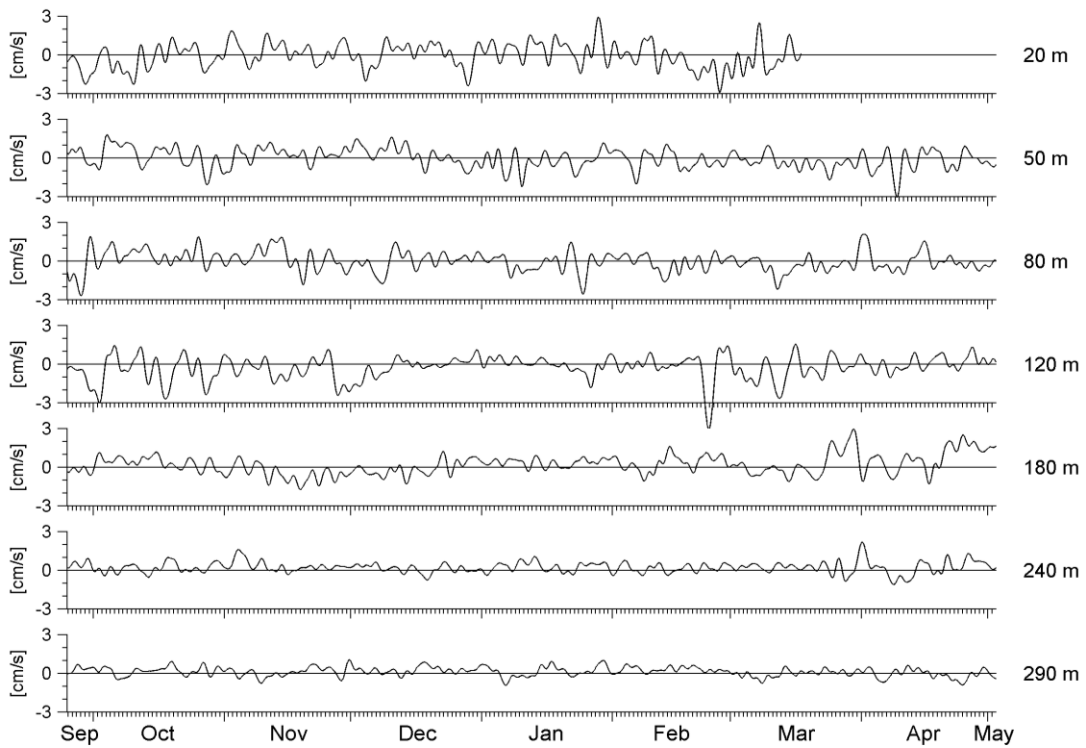
Figure 3.8. Components V (cross fjord). Filtered data. Location Gato.
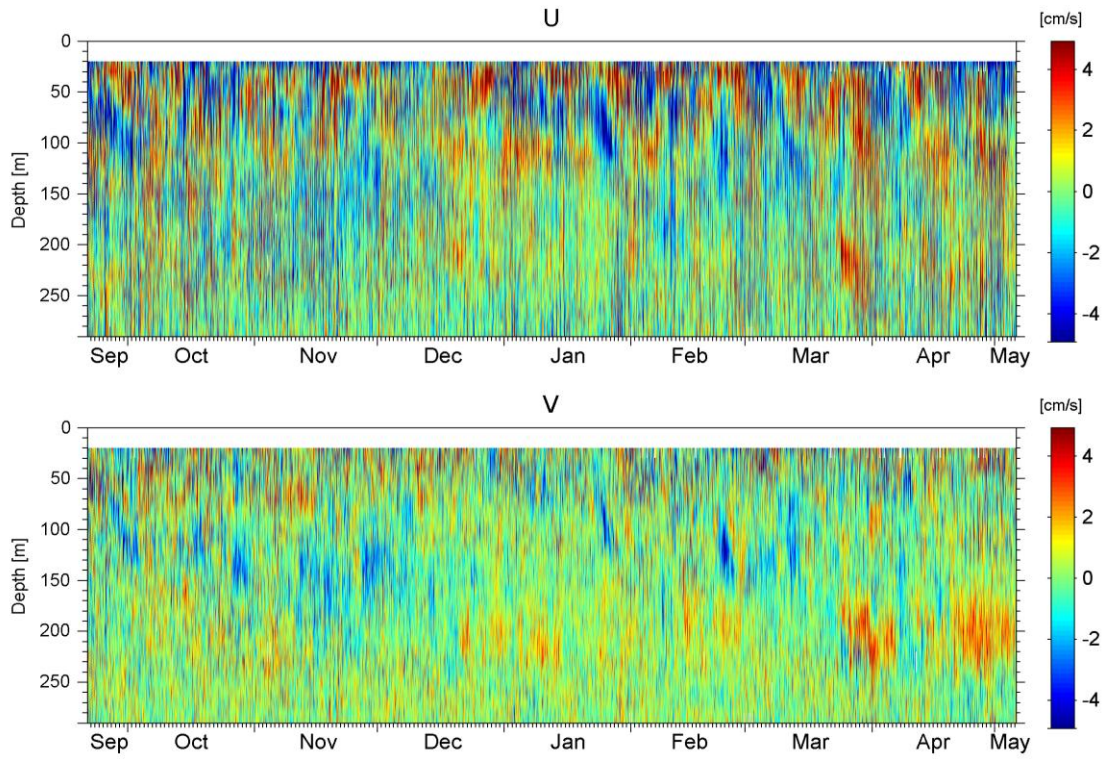
Figure 3.9. Components U (along fjord) and V(cross fjord). Location Gato.
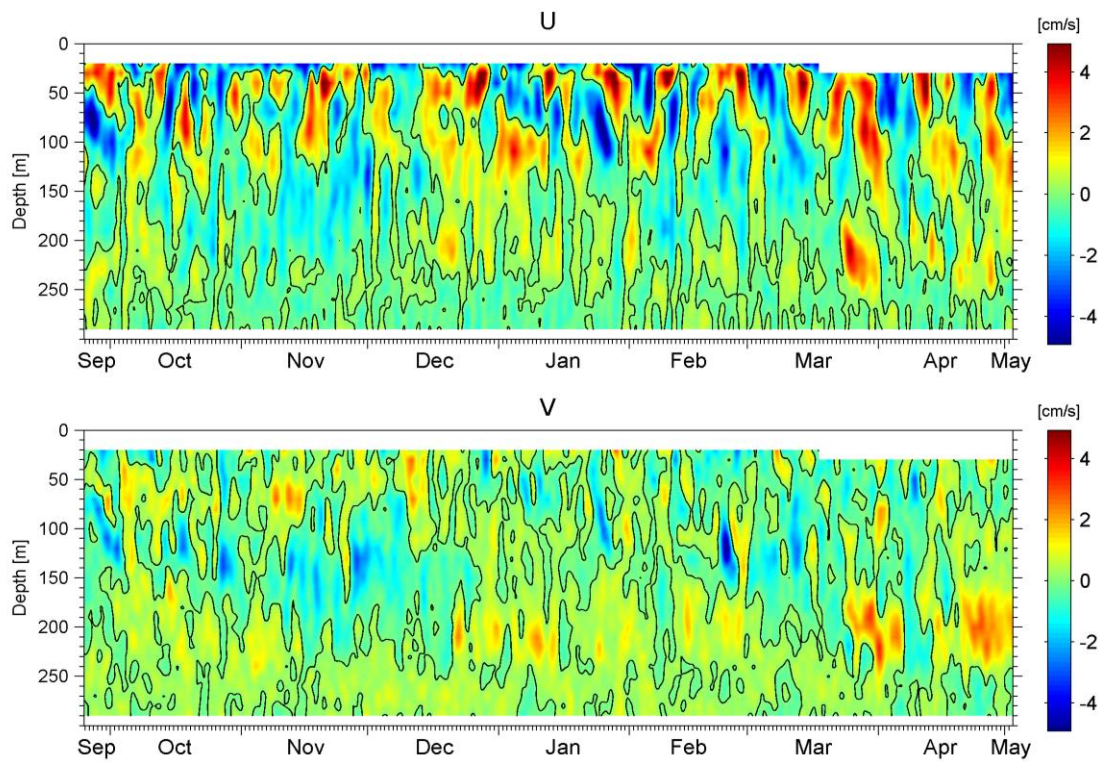
Figure 3.10. Components U (along fjord) and V(cross fjord). Filtered data. Location Gato.
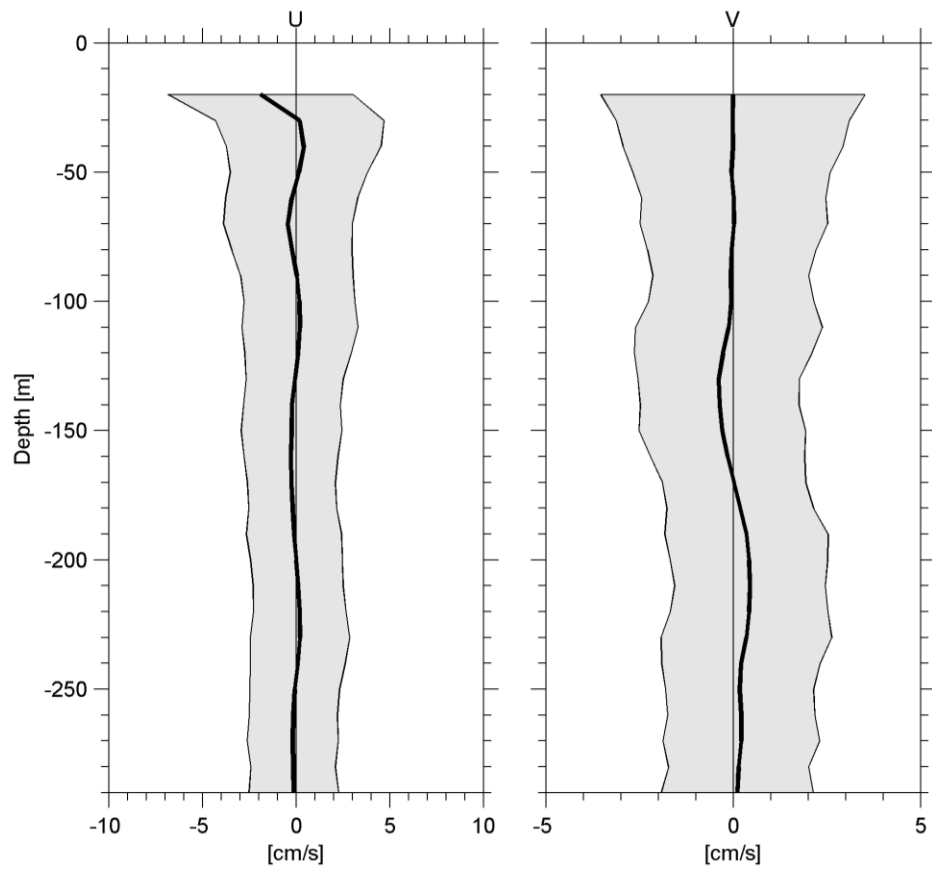
Figure 3.11. Profile average of along (U) and cross (V) fjord components. Location Gato.
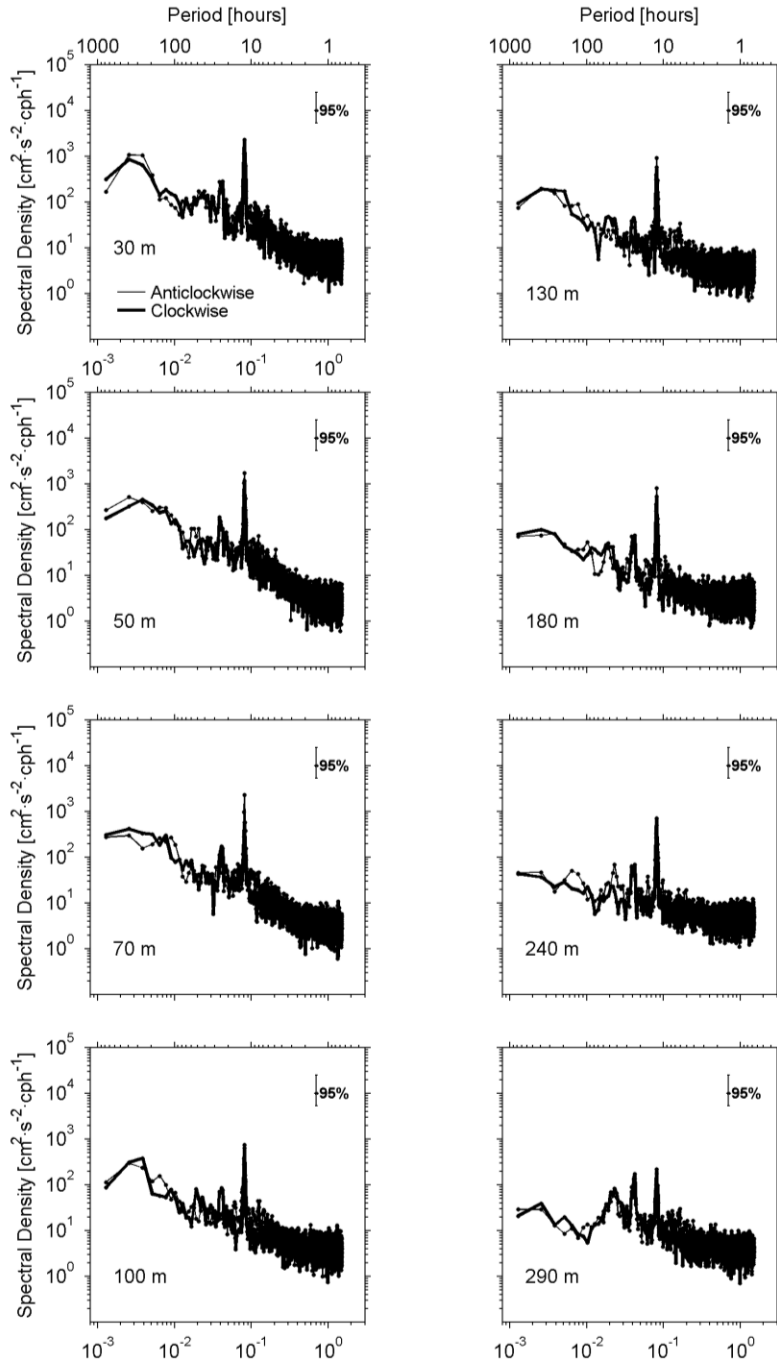
Figure 3.12. Clockwise and anticlockwise spectra of kinetic energy density. Spectral calculations were made with 14 degrees of freedom (~33 days). Location Gato.
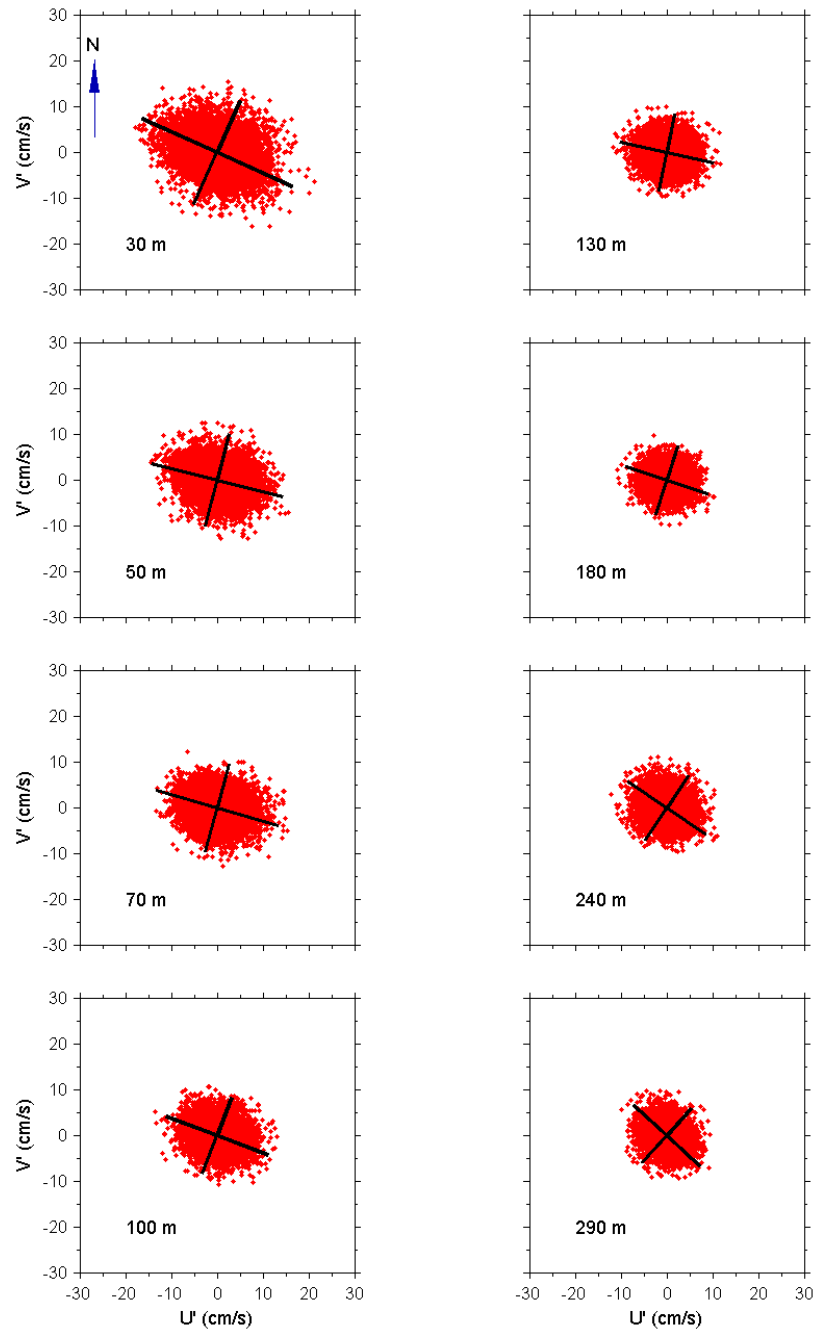
Figure 3.13. Scatter diagrams and principals axes. Arrow direction indicate north. The long of axes is 4 standard desviation. Location Gato.
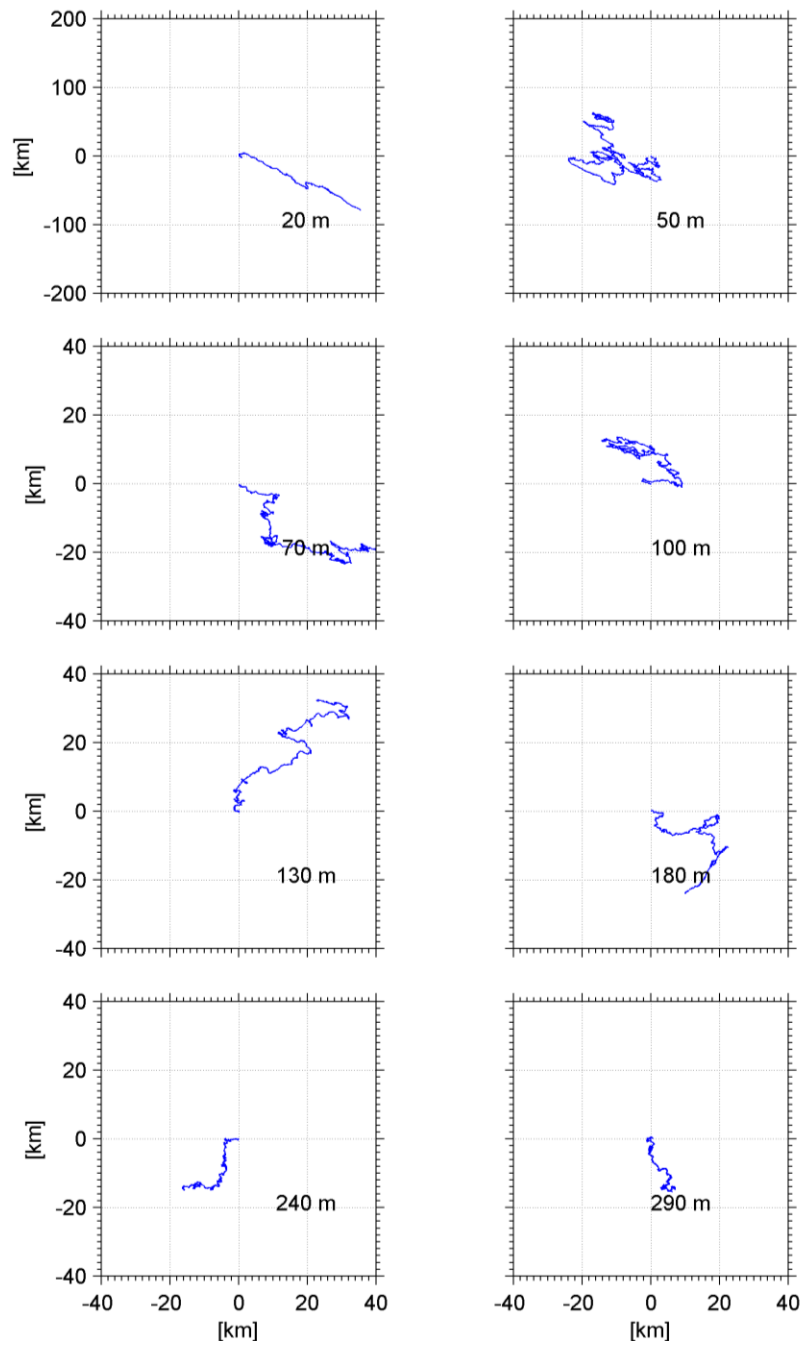
Figure 3.14. Progresive vector diagrams. The axes data no rotated. Location Gato.
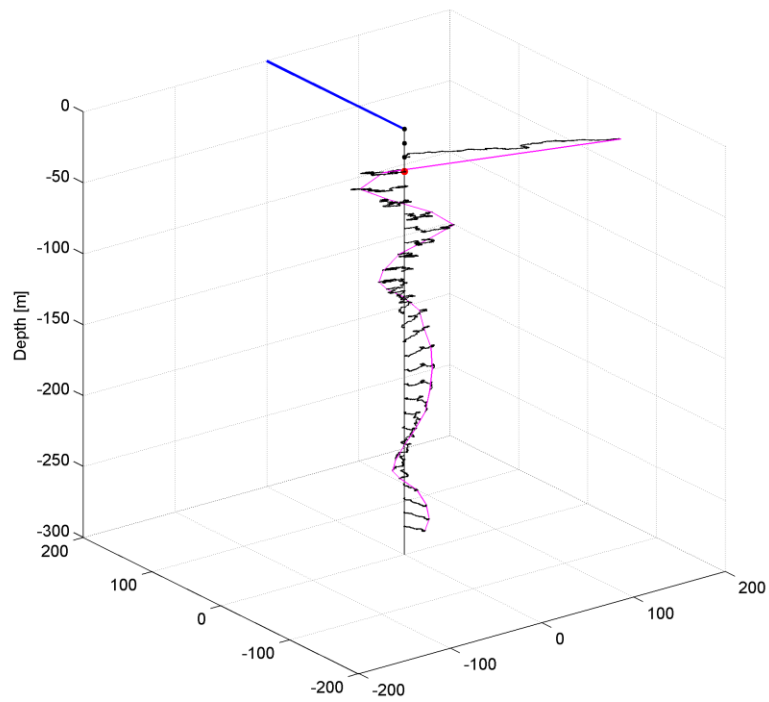
Figure 3.15. Progresive vector diagrams all depth. The line blue indicate to north. Axes data no rotated. Location Gato.

Table 3.1. Statistics of the current records at Gato. $\overline{|v|}$, $|v|_{max}$, $|v|_{std}$, $\overline{u}$, u', $\overline{v}$, v', u'v', K_e and N are magnitude mean, magnitude maximum, standard deviation of magnitude, average, standard deviation and covariance of components u and v, kinetics energy and number of data.

Depth (m)	$\overline{|v|}$ (cm/s)	$|v|_{max}$ (cm/s)	$|v|_{std}$ (cm/s)	$\overline{u}$ (cm/s)	u' (cm/s)	$\overline{v}$ (cm/s)	v' (cm/s)	u'v' (cm^2/s^2)	K_e (cm^2/s^2)	N
20	5.36	29.20	3.43	-1.90	4.94	-0.01	3.53	-2.68	18.41	15597
30	4.67	21.96	2.85	0.19	4.50	-0.01	3.11	-0.02	14.96	16205
40	4.35	20.20	2.63	0.40	4.14	-0.01	2.93	0.99	12.85	16312
50	3.89	16.90	2.29	0.14	3.66	-0.05	2.63	1.11	10.16	16371
60	3.73	17.52	2.16	-0.25	3.53	0.01	2.46	0.90	9.25	16377
70	3.70	16.51	2.15	-0.45	3.44	0.01	2.51	0.82	9.05	16386
80	3.37	15.35	2.01	-0.23	3.21	-0.04	2.25	0.27	7.67	16377
90	3.13	14.21	1.89	0.03	3.00	-0.07	2.08	0.00	6.68	16379
100	3.17	14.73	1.91	0.17	2.96	-0.06	2.21	0.21	6.81	16370
110	3.43	15.08	2.03	0.20	3.10	-0.12	2.50	0.48	7.91	16366
120	3.20	13.49	1.87	0.10	2.84	-0.27	2.37	0.57	6.84	16352
130	2.95	12.54	1.68	-0.08	2.59	-0.39	2.15	0.46	5.67	16380
140	2.91	12.21	1.69	-0.22	2.58	-0.37	2.12	0.43	5.58	16308
150	3.04	12.88	1.76	-0.25	2.69	-0.29	2.22	0.37	6.09	16239
160	2.82	12.68	1.64	-0.28	2.51	-0.15	2.06	0.29	5.26	16220
170	2.63	11.31	1.51	-0.25	2.35	0.02	1.91	0.27	4.59	16307
180	2.67	11.37	1.52	-0.19	2.35	0.19	1.96	0.18	4.68	16075
190	2.92	12.67	1.68	-0.11	2.54	0.35	2.18	0.12	5.60	15926
200	2.82	12.20	1.63	0.01	2.45	0.42	2.10	0.02	5.21	15874
210	2.74	11.44	1.60	0.11	2.40	0.44	2.01	-0.10	4.91	16252
220	2.83	12.15	1.66	0.19	2.47	0.42	2.10	-0.17	5.27	15846
230	3.03	13.34	1.78	0.20	2.65	0.35	2.28	-0.24	6.11	15762
240	2.85	12.61	1.69	0.09	2.53	0.20	2.12	-0.36	5.45	15792
250	2.67	11.87	1.59	-0.08	2.39	0.17	1.97	-0.32	4.81	16221
260	2.64	11.16	1.57	-0.16	2.35	0.21	1.96	-0.30	4.70	15947
270	2.78	12.14	1.63	-0.19	2.43	0.21	2.09	-0.53	5.15	15916
280	2.53	11.62	1.49	-0.16	2.26	0.14	1.87	-0.61	4.30	16057
290	2.74	11.80	1.55	-0.13	2.40	0.11	2.03	-0.62	4.94	16100

Table 3.2. Constituents of the tidal currents at Gato (30 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (⊐)	Error (⊐)	Phase (⊐)	Error (⊐)	SNR
*SSA	0.0002	0.66	0.42	-0.29	0.25	165.00	34.95	86.03	59.22	2.42
*MSM	0.0013	0.09	0.31	0.00	0.24	133.75	73.39	126.11	207.68	0.09
*MM	0.0015	0.96	0.49	-0.16	0.29	168.47	19.28	59.06	33.23	3.80
*MSF	0.0028	1.67	0.51	0.14	0.28	178.93	10.06	95.47	20.03	10.67
*MF	0.0031	0.89	0.49	0.05	0.29	167.46	19.16	13.54	32.62	3.26
*ALP1	0.0344	0.22	0.23	-0.04	0.16	20.20	40.62	102.63	75.57	0.86
*2Q1	0.0357	0.17	0.22	-0.02	0.14	3.31	49.31	96.16	87.71	0.62
*SIG1	0.0359	0.04	0.15	-0.01	0.14	49.76	78.45	199.29	207.33	0.06
*Q1	0.0372	0.21	0.23	0.02	0.17	162.56	43.29	312.09	79.71	0.77
*RHO1	0.0374	0.11	0.15	-0.02	0.12	27.25	66.54	43.08	152.14	0.49
*O1	0.0387	0.60	0.28	0.05	0.16	1.35	14.73	219.44	26.74	4.62
*TAU1	0.0390	0.50	0.32	0.04	0.18	177.35	21.83	45.41	39.93	2.34
*BET1	0.0400	0.19	0.15	0.01	0.20	96.14	92.73	199.95	65.94	1.62
*NO1	0.0403	0.09	0.15	-0.04	0.11	153.93	69.86	31.66	108.39	0.37
*CHI1	0.0405	0.21	0.22	-0.01	0.17	152.66	42.74	294.19	72.23	0.93
*P1	0.0416	0.31	0.23	-0.17	0.21	148.43	58.78	335.80	74.31	1.91
*K1	0.0418	0.39	0.24	0.02	0.18	168.70	26.74	113.24	44.41	2.64
*PHI1	0.0420	0.65	0.32	-0.11	0.17	0.70	15.65	148.26	29.97	4.26
*THE1	0.0431	0.20	0.22	0.00	0.15	24.67	46.01	23.83	77.20	0.84
*J1	0.0433	0.23	0.24	0.06	0.15	14.17	46.64	321.05	71.47	0.94
*SO1	0.0446	0.18	0.16	-0.02	0.21	62.57	83.58	52.12	79.91	1.35
*OO1	0.0448	0.09	0.14	-0.06	0.12	151.93	78.18	294.95	127.76	0.40
*UPS1	0.0463	0.06	0.14	-0.01	0.11	161.83	65.85	11.67	151.19	0.22
*OQ2	0.0760	0.12	0.32	0.01	0.24	124.26	89.14	301.33	158.29	0.14
*EPS2	0.0762	0.19	0.27	0.02	0.23	154.07	62.14	344.23	112.85	0.51
*2N2	0.0775	0.14	0.25	0.08	0.24	8.08	68.94	256.13	146.23	0.32
*MU2	0.0777	0.19	0.26	0.01	0.26	123.14	84.51	24.09	107.88	0.53
*N2	0.0790	0.57	0.36	-0.31	0.21	173.52	43.90	91.07	52.66	2.50
*NU2	0.0792	0.16	0.28	-0.07	0.23	26.07	83.74	56.33	144.43	0.34
*M2	0.0805	1.93	0.42	-1.01	0.24	176.40	12.54	114.71	15.99	21.07
*MKS2	0.0807	0.51	0.26	0.33	0.24	148.79	67.17	22.92	65.44	3.79
*LDA2	0.0818	0.29	0.26	0.11	0.29	143.18	71.36	65.63	84.90	1.30
*L2	0.0820	0.32	0.30	-0.04	0.24	146.47	55.91	119.25	75.39	1.15
*S2	0.0833	0.93	0.32	-0.51	0.26	32.48	31.21	284.91	36.62	8.32
*K2	0.0836	0.38	0.29	0.16	0.19	2.42	46.98	258.22	71.68	1.79
*MSN2	0.0848	0.12	0.26	-0.06	0.23	144.72	86.82	347.53	172.26	0.22
*ETA2	0.0851	0.08	0.22	-0.02	0.20	34.28	82.37	266.62	177.33	0.14
*MO3	0.1192	0.12	0.15	0.11	0.13	62.39	120.36	359.90	121.88	0.62
*M3	0.1208	0.09	0.15	-0.07	0.16	80.31	143.96	275.30	134.56	0.36
*SO3	0.1221	0.16	0.15	0.08	0.15	13.63	64.76	357.71	76.13	1.13
*MK3	0.1223	0.16	0.15	-0.04	0.12	158.29	63.34	182.87	85.21	1.08
*SK3	0.1251	0.16	0.15	-0.01	0.14	135.17	73.83	251.99	69.91	1.10
*MN4	0.1595	0.05	0.11	-0.03	0.12	87.84	123.94	23.96	175.55	0.24
*M4	0.1610	0.20	0.15	-0.02	0.13	56.56	60.97	331.53	51.12	1.78
*SN4	0.1623	0.13	0.15	0.02	0.13	92.43	78.26	43.87	71.19	0.82
*MS4	0.1638	0.26	0.14	-0.05	0.15	89.91	41.61	354.31	38.52	3.11
*MK4	0.1641	0.17	0.12	0.13	0.12	99.97	106.17	252.45	119.34	1.95
*S4	0.1667	0.09	0.13	-0.04	0.10	165.15	101.52	14.70	129.55	0.54
*SK4	0.1669	0.12	0.12	-0.03	0.13	130.15	72.52	297.12	77.80	1.06
*2MK5	0.2028	0.08	0.09	0.01	0.09	89.96	93.07	38.73	80.82	0.72
*2SK5	0.2084	0.04	0.07	-0.01	0.08	69.03	129.56	322.92	144.81	0.37
*2MN6	0.2400	0.05	0.08	-0.01	0.07	65.96	110.00	77.90	118.14	0.42
*M6	0.2415	0.10	0.10	-0.01	0.09	42.63	64.88	124.86	65.48	0.99
*2MS6	0.2444	0.08	0.08	0.03	0.09	68.63	86.02	48.85	89.50	1.01
*2MK6	0.2446	0.08	0.08	0.02	0.08	23.40	75.86	275.70	77.75	1.18
*2SM6	0.2472	0.09	0.09	0.04	0.09	27.09	88.30	135.03	91.36	1.01
*MSK6	0.2474	0.09	0.08	-0.02	0.07	160.95	68.14	248.78	64.91	1.29
*3MK7	0.2833	0.08	0.07	0.05	0.08	135.04	104.18	306.37	109.84	1.15
*M8	0.3220	0.08	0.06	0.01	0.07	66.98	79.29	219.45	77.75	1.45

Percent variance predicted = 23.0% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 3.3. Constituents of the tidal currents at Gato (50 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (⊐)	Error (⊐)	Phase (⊐)	Error (⊐)	SNR
*SSA	0.0002	0.30	0.52	-0.01	0.41	46.26	57.11	116.75	135.93	0.34
*MSM	0.0013	0.50	0.73	-0.12	0.31	179.21	27.90	58.60	96.47	0.48
*MM	0.0015	0.84	0.86	0.12	0.26	172.37	22.16	83.53	66.32	0.96
*MSF	0.0028	1.03	0.82	0.20	0.30	0.36	18.68	317.54	57.71	1.58
*MF	0.0031	0.44	0.69	-0.01	0.30	178.21	33.63	62.95	115.48	0.40
*ALP1	0.0344	0.16	0.12	0.06	0.17	105.86	103.87	80.60	69.69	1.66
*2Q1	0.0357	0.05	0.15	0.01	0.12	75.00	93.32	177.00	182.30	0.11
*SIG1	0.0359	0.15	0.15	0.02	0.10	177.62	43.61	355.58	111.59	0.93
*Q1	0.0372	0.17	0.18	-0.04	0.11	154.56	43.02	320.54	79.90	0.92
*RHO1	0.0374	0.09	0.15	0.05	0.11	28.56	64.28	86.15	131.45	0.36
*O1	0.0387	0.50	0.20	-0.02	0.12	169.95	14.26	358.91	22.82	6.24
*TAU1	0.0390	0.33	0.24	0.00	0.13	177.02	25.16	42.18	48.43	1.78
*BET1	0.0400	0.20	0.19	-0.01	0.11	168.05	31.17	71.79	61.61	1.15
*NO1	0.0403	0.17	0.16	0.03	0.09	179.98	32.31	344.86	73.30	1.15
*CHI1	0.0405	0.07	0.12	0.02	0.14	92.36	174.09	262.64	99.01	0.35
*P1	0.0416	0.38	0.22	-0.03	0.13	163.50	19.75	301.83	40.62	2.88
*K1	0.0418	0.20	0.21	-0.04	0.11	2.97	31.00	194.06	81.16	0.91
*PHI1	0.0420	0.32	0.23	-0.04	0.13	173.54	24.29	332.95	47.20	1.97
*THE1	0.0431	0.15	0.15	-0.09	0.14	45.84	79.53	42.10	102.16	1.01
*J1	0.0433	0.20	0.19	0.03	0.10	2.29	37.30	289.31	70.24	1.03
*SO1	0.0446	0.10	0.15	0.04	0.11	166.37	61.99	217.76	175.74	0.43
*OO1	0.0448	0.06	0.12	-0.03	0.09	164.79	54.76	261.48	138.57	0.27
*UPS1	0.0463	0.11	0.13	0.03	0.08	171.22	47.60	302.45	112.28	0.69
*OQ2	0.0760	0.26	0.23	-0.03	0.26	166.71	72.57	278.52	75.23	1.25
*EPS2	0.0762	0.17	0.20	0.02	0.17	112.33	81.65	359.35	107.53	0.72
*2N2	0.0775	0.33	0.23	0.11	0.26	154.57	62.07	19.93	58.96	2.04
*MU2	0.0777	0.10	0.18	-0.09	0.19	75.71	131.43	94.43	159.53	0.31
*N2	0.0790	0.52	0.23	0.03	0.26	10.45	32.68	225.13	27.79	5.31
*NU2	0.0792	0.10	0.17	0.00	0.19	15.18	139.37	106.87	139.42	0.32
*M2	0.0805	2.20	0.22	0.26	0.28	34.10	7.23	251.60	6.45	100.10
*MKS2	0.0807	0.56	0.21	0.21	0.20	50.20	25.39	68.03	24.95	7.04
*LDA2	0.0818	0.23	0.20	0.06	0.22	111.07	69.02	137.23	73.46	1.28
*L2	0.0820	0.18	0.24	-0.09	0.20	106.96	97.49	190.51	109.30	0.59
*S2	0.0833	1.00	0.28	0.18	0.23	30.66	18.14	281.09	13.20	13.22
*K2	0.0836	0.26	0.18	0.06	0.20	161.50	64.96	346.72	51.25	2.11
*MSN2	0.0848	0.08	0.18	0.03	0.20	48.90	125.79	347.03	157.94	0.22
*ETA2	0.0851	0.15	0.17	-0.03	0.18	31.70	95.94	295.95	95.82	0.80
*MO3	0.1192	0.07	0.10	0.00	0.09	161.76	84.07	295.90	117.50	0.51
*M3	0.1208	0.08	0.09	0.01	0.11	61.09	112.60	305.59	106.55	0.68
*SO3	0.1221	0.12	0.13	0.04	0.11	14.07	66.55	351.44	72.65	0.94
*MK3	0.1223	0.16	0.12	0.01	0.12	1.79	46.97	43.10	52.56	1.73
*SK3	0.1251	0.11	0.13	-0.00	0.12	136.09	70.37	331.38	73.68	0.80
*MN4	0.1595	0.11	0.10	0.02	0.10	154.22	77.80	317.47	79.86	1.31
*M4	0.1610	0.11	0.11	0.02	0.12	161.38	72.22	359.95	60.60	1.09
*SN4	0.1623	0.11	0.11	0.01	0.09	101.79	67.10	14.11	75.19	1.09
*MS4	0.1638	0.09	0.10	0.00	0.09	113.35	74.40	49.12	86.54	0.77
*MK4	0.1641	0.08	0.08	0.05	0.09	51.27	100.10	184.61	95.37	1.04
*S4	0.1667	0.06	0.10	-0.01	0.08	118.88	93.65	129.11	115.18	0.39
*SK4	0.1669	0.07	0.08	0.03	0.08	133.79	95.82	234.50	112.41	0.73
*2MK5	0.2028	0.07	0.08	0.02	0.07	114.97	88.27	314.30	91.03	0.74
*2SK5	0.2084	0.05	0.07	0.02	0.07	109.27	107.59	302.22	119.56	0.50
*2MN6	0.2400	0.05	0.06	-0.03	0.06	32.87	113.22	146.49	131.51	0.68
*M6	0.2415	0.06	0.06	0.01	0.07	35.15	83.47	93.78	86.39	0.84
*2MS6	0.2444	0.09	0.08	-0.03	0.07	53.10	62.39	135.33	60.55	1.57
*2MK6	0.2446	0.10	0.06	0.05	0.07	47.07	71.97	309.70	67.70	2.60
*2SM6	0.2472	0.04	0.07	0.00	0.06	68.78	98.79	240.73	109.99	0.37
*MSK6	0.2474	0.07	0.07	0.04	0.06	42.64	84.58	286.09	94.63	0.98
*3MK7	0.2833	0.04	0.06	0.03	0.06	110.29	128.38	227.98	142.42	0.50
*M8	0.3220	0.06	0.05	0.01	0.05	59.59	72.68	152.65	64.81	1.17

Percent variance predicted = 24.7% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 3.4. Constituents of the tidal currents at Gato (70 m)

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (⊐)	Error (⊐)	Phase (⊐)	Error (⊐)	SNR
*SSA	0.0002	0.33	0.42	0.06	0.33	45.72	73.94	88.50	96.93	0.64
*MSM	0.0013	0.35	0.42	-0.14	0.32	28.65	61.39	232.31	114.12	0.69
*MM	0.0015	0.52	0.57	0.15	0.29	14.91	42.67	305.53	68.37	0.83
*MSF	0.0028	0.87	0.56	0.03	0.34	179.65	21.44	171.66	40.72	2.44
*MF	0.0031	0.30	0.38	0.17	0.33	43.79	91.60	356.08	118.35	0.63
*ALP1	0.0344	0.18	0.19	0.03	0.12	169.26	43.25	97.70	60.66	0.93
*2Q1	0.0357	0.08	0.13	0.02	0.12	131.90	104.24	181.22	131.49	0.34
*SIG1	0.0359	0.13	0.14	-0.04	0.11	146.64	60.11	357.99	90.39	0.85
*Q1	0.0372	0.03	0.12	0.02	0.10	12.65	79.61	176.19	199.49	0.08
*RHO1	0.0374	0.08	0.13	-0.03	0.11	146.69	70.37	146.81	134.21	0.37
*O1	0.0387	0.35	0.19	-0.09	0.11	174.42	20.78	351.47	35.84	3.63
*TAU1	0.0390	0.14	0.19	-0.07	0.12	171.34	65.54	5.52	147.45	0.53
*BET1	0.0400	0.15	0.15	-0.03	0.15	148.27	47.36	76.73	73.07	0.95
*NO1	0.0403	0.08	0.11	0.01	0.09	166.61	68.85	280.40	121.66	0.51
*CHI1	0.0405	0.06	0.12	-0.00	0.09	179.54	68.14	123.26	207.69	0.29
*P1	0.0416	0.41	0.20	-0.11	0.14	156.47	25.81	300.08	31.60	4.23
*K1	0.0418	0.35	0.19	-0.19	0.11	2.37	36.40	206.97	54.24	3.40
*PHI1	0.0420	0.25	0.18	0.04	0.13	158.21	31.98	294.31	53.70	2.00
*THE1	0.0431	0.05	0.11	-0.05	0.10	129.50	101.65	351.95	178.38	0.23
*J1	0.0433	0.09	0.15	0.07	0.13	94.65	178.46	31.80	122.75	0.33
*SO1	0.0446	0.06	0.13	0.03	0.10	165.63	80.28	98.06	151.50	0.20
*OO1	0.0448	0.07	0.11	-0.00	0.07	167.94	60.43	238.02	124.84	0.45
*UPS1	0.0463	0.06	0.11	-0.03	0.08	10.30	69.78	37.70	152.62	0.27
*OQ2	0.0760	0.17	0.17	0.02	0.18	175.62	86.55	249.08	116.27	1.07
*EPS2	0.0762	0.13	0.17	-0.02	0.12	6.00	96.38	118.16	106.88	0.55
*2N2	0.0775	0.22	0.19	-0.07	0.17	157.38	54.60	351.38	58.91	1.30
*MU2	0.0777	0.19	0.16	-0.02	0.17	21.64	62.71	144.34	62.59	1.50
*N2	0.0790	0.57	0.17	0.11	0.16	16.12	17.92	215.86	18.60	11.69
*NU2	0.0792	0.15	0.16	0.04	0.15	26.46	78.97	185.99	71.49	0.95
*M2	0.0805	2.18	0.18	0.74	0.19	18.62	5.88	259.62	5.58	141.71
*MKS2	0.0807	0.27	0.17	0.05	0.15	152.97	35.97	255.84	36.38	2.70
*LDA2	0.0818	0.25	0.15	0.17	0.16	65.37	81.39	227.05	71.44	3.03
*L2	0.0820	0.31	0.17	0.01	0.18	3.59	34.90	252.52	35.23	3.26
*S2	0.0833	0.84	0.18	0.12	0.18	17.56	12.59	297.50	11.93	21.56
*K2	0.0836	0.24	0.13	0.16	0.14	149.87	84.01	18.90	77.04	3.26
*MSN2	0.0848	0.16	0.16	0.03	0.17	131.59	71.77	217.38	80.95	0.98
*ETA2	0.0851	0.14	0.12	-0.02	0.14	15.99	64.99	279.98	74.66	1.34
*MO3	0.1192	0.08	0.08	0.00	0.09	5.56	83.59	239.87	82.90	1.06
*M3	0.1208	0.07	0.10	0.04	0.09	143.27	102.10	169.68	118.21	0.58
*SO3	0.1221	0.02	0.07	-0.01	0.07	66.19	120.82	104.94	211.42	0.12
*MK3	0.1223	0.10	0.08	0.07	0.10	91.32	94.62	48.83	83.00	1.39
*SK3	0.1251	0.11	0.09	0.08	0.10	125.67	93.35	99.93	92.85	1.59
*MN4	0.1595	0.12	0.09	-0.01	0.09	161.57	52.75	285.88	63.02	1.64
*M4	0.1610	0.20	0.09	-0.01	0.11	165.28	29.76	22.17	33.27	4.52
*SN4	0.1623	0.12	0.10	0.04	0.08	110.98	65.64	275.02	53.27	1.51
*MS4	0.1638	0.11	0.10	0.04	0.09	12.35	67.47	198.56	80.11	1.09
*MK4	0.1641	0.08	0.08	-0.02	0.07	146.10	75.32	95.17	80.23	1.03
*S4	0.1667	0.12	0.10	0.04	0.09	166.85	57.45	153.84	68.08	1.52
*SK4	0.1669	0.05	0.07	0.01	0.06	23.33	94.91	313.42	104.10	0.49
*2MK5	0.2028	0.05	0.07	-0.01	0.07	100.86	78.74	3.59	115.09	0.57
*2SK5	0.2084	0.06	0.07	-0.03	0.07	112.91	105.84	245.76	126.42	0.70
*2MN6	0.2400	0.06	0.06	-0.02	0.07	16.87	102.47	173.23	77.33	1.04
*M6	0.2415	0.06	0.07	0.01	0.05	81.70	58.52	186.90	87.52	0.75
*2MS6	0.2444	0.04	0.06	0.00	0.06	143.35	100.78	315.44	144.14	0.44
*2MK6	0.2446	0.06	0.06	0.03	0.05	68.04	84.85	301.85	93.50	1.02
*2SM6	0.2472	0.03	0.06	-0.02	0.06	52.00	103.37	262.34	160.68	0.27
*MSK6	0.2474	0.07	0.06	0.04	0.06	3.76	109.05	312.37	92.77	1.05
*3MK7	0.2833	0.01	0.05	-0.00	0.05	28.85	131.43	119.41	208.81	0.08
*M8	0.3220	0.05	0.06	-0.02	0.06	13.68	101.45	133.95	101.61	0.69

Percent variance predicted = 24.7% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 3.5. Constituents of the tidal currents at Gato (100 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (⅃)	Error (⅃)	Phase (⅃)	Error (⅃)	SNR
*SSA	0.0002	0.48	0.47	0.09	0.28	8.81	32.17	147.89	61.60	1.03
*MSM	0.0013	0.20	0.41	0.11	0.23	19.36	62.71	197.54	148.79	0.24
*MM	0.0015	0.70	0.48	-0.09	0.26	12.32	24.69	61.20	47.18	2.12
*MSF	0.0028	1.13	0.47	-0.01	0.27	12.04	13.46	67.58	25.57	5.78
*MF	0.0031	0.61	0.46	-0.07	0.24	179.22	27.31	219.60	53.41	1.78
*ALP1	0.0344	0.08	0.10	0.01	0.09	129.45	83.21	215.31	81.91	0.69
*2Q1	0.0357	0.05	0.08	-0.02	0.07	165.18	90.91	217.65	155.09	0.30
*SIG1	0.0359	0.04	0.08	0.02	0.07	113.63	136.83	4.00	166.52	0.23
*Q1	0.0372	0.08	0.09	-0.03	0.09	113.31	106.43	13.05	96.53	0.86
*RHO1	0.0374	0.10	0.12	0.03	0.08	175.89	52.06	95.40	81.21	0.74
*O1	0.0387	0.21	0.11	-0.13	0.09	168.91	51.47	3.03	65.51	3.99
*TAU1	0.0390	0.08	0.10	-0.07	0.09	30.13	95.54	101.72	141.48	0.66
*BET1	0.0400	0.08	0.10	0.00	0.08	36.56	74.19	112.53	105.92	0.60
*NO1	0.0403	0.07	0.07	-0.03	0.07	103.58	100.59	34.43	90.00	0.85
*CHI1	0.0405	0.14	0.11	0.00	0.08	177.19	37.30	180.67	58.84	1.52
*P1	0.0416	0.05	0.09	0.02	0.07	179.41	85.24	300.48	171.81	0.23
*K1	0.0418	0.24	0.11	-0.15	0.08	154.83	58.38	69.04	67.13	4.48
*PHI1	0.0420	0.08	0.11	0.01	0.09	152.71	66.41	355.41	94.94	0.57
*THE1	0.0431	0.10	0.09	0.04	0.11	132.51	81.31	325.25	92.84	1.16
*J1	0.0433	0.08	0.10	0.00	0.09	151.14	65.81	59.79	107.99	0.70
*SO1	0.0446	0.07	0.09	-0.02	0.08	118.33	111.35	220.96	96.49	0.66
*OO1	0.0448	0.04	0.07	0.01	0.05	160.40	78.06	184.50	158.47	0.25
*UPS1	0.0463	0.07	0.08	0.04	0.07	18.96	86.77	23.91	137.70	0.78
*OQ2	0.0760	0.09	0.14	-0.02	0.12	122.22	98.10	341.03	109.10	0.40
*EPS2	0.0762	0.12	0.14	0.03	0.11	42.59	88.46	96.83	88.86	0.70
*2N2	0.0775	0.13	0.15	0.08	0.14	157.42	114.90	315.55	108.50	0.84
*MU2	0.0777	0.20	0.13	-0.02	0.15	2.17	42.93	180.59	44.62	2.59
*N2	0.0790	0.46	0.14	0.07	0.14	174.31	20.93	33.55	19.50	10.58
*NU2	0.0792	0.14	0.12	0.06	0.13	41.19	81.53	253.67	83.84	1.42
*M2	0.0805	1.60	0.15	0.02	0.15	176.99	5.24	79.28	5.30	112.12
*MKS2	0.0807	0.18	0.12	0.08	0.12	92.34	52.83	136.07	53.70	2.55
*LDA2	0.0818	0.07	0.11	0.01	0.10	127.57	104.79	128.89	134.04	0.38
*L2	0.0820	0.26	0.13	0.09	0.16	18.57	44.18	236.06	42.91	3.94
*S2	0.0833	0.43	0.14	-0.10	0.15	4.15	24.08	279.94	20.54	9.09
*K2	0.0836	0.12	0.11	-0.04	0.11	91.23	67.74	231.37	74.20	1.21
*MSN2	0.0848	0.11	0.13	0.04	0.13	6.42	97.75	37.21	85.27	0.78
*ETA2	0.0851	0.11	0.11	-0.02	0.10	92.62	76.47	290.01	75.90	1.06
*MO3	0.1192	0.06	0.07	0.02	0.07	122.24	90.90	59.02	95.02	0.89
*M3	0.1208	0.08	0.07	0.01	0.08	12.22	86.74	29.25	83.46	1.32
*SO3	0.1221	0.10	0.09	0.05	0.07	166.01	73.76	343.85	79.64	1.26
*MK3	0.1223	0.09	0.08	0.04	0.08	36.16	79.05	124.53	81.11	1.14
*SK3	0.1251	0.09	0.08	0.04	0.07	50.10	85.05	101.78	80.05	1.33
*MN4	0.1595	0.06	0.06	0.03	0.06	110.34	100.91	331.74	108.68	1.02
*M4	0.1610	0.14	0.07	0.09	0.08	9.89	77.58	202.91	69.58	4.07
*SN4	0.1623	0.08	0.07	0.02	0.07	124.63	70.44	305.63	74.53	1.40
*MS4	0.1638	0.12	0.07	0.05	0.08	68.30	54.28	295.96	52.76	2.61
*MK4	0.1641	0.10	0.07	0.01	0.06	155.81	41.81	105.14	39.12	2.27
*S4	0.1667	0.03	0.05	0.02	0.05	56.07	129.77	66.50	147.41	0.36
*SK4	0.1669	0.05	0.06	0.02	0.05	38.66	83.80	340.87	96.45	0.73
*2MK5	0.2028	0.08	0.08	0.00	0.06	111.99	52.53	268.09	60.45	1.08
*2SK5	0.2084	0.03	0.06	-0.01	0.05	152.46	112.54	137.39	130.99	0.28
*2MN6	0.2400	0.05	0.05	0.01	0.06	77.76	71.43	356.05	74.40	1.12
*M6	0.2415	0.05	0.05	0.02	0.06	135.37	94.21	135.18	106.40	0.84
*2MS6	0.2444	0.04	0.06	-0.02	0.05	143.97	110.05	106.53	112.48	0.43
*2MK6	0.2446	0.04	0.04	0.02	0.05	27.65	84.40	301.78	94.52	0.89
*2SM6	0.2472	0.04	0.05	-0.02	0.04	133.25	108.28	122.38	108.41	0.57
*MSK6	0.2474	0.02	0.04	0.02	0.05	86.67	141.03	133.99	132.19	0.30
*3MK7	0.2833	0.04	0.05	-0.01	0.05	78.92	84.43	220.23	102.09	0.60
*M8	0.3220	0.05	0.05	0.04	0.05	53.42	103.77	66.38	112.58	1.17

Percent variance predicted = 22.7% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 3.6. Constituents of the tidal currents at Gato (130 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (⌐)	Error (⌐)	Phase (⌐)	Error (⌐)	SNR
*SSA	0.0002	0.15	0.31	0.03	0.28	139.86	93.71	304.01	176.20	0.22
*MSM	0.0013	0.10	0.29	-0.05	0.30	119.03	148.23	187.01	178.58	0.13
*MM	0.0015	0.24	0.36	-0.03	0.29	7.43	64.89	53.35	117.28	0.45
*MSF	0.0028	0.77	0.46	0.03	0.37	18.86	27.62	76.09	37.39	2.75
*MF	0.0031	0.08	0.27	0.03	0.28	151.74	102.73	204.08	251.42	0.09
*ALP1	0.0344	0.05	0.07	0.04	0.07	139.66	108.18	353.79	138.16	0.43
*2Q1	0.0357	0.06	0.08	0.01	0.06	170.00	75.35	70.82	137.27	0.65
*SIG1	0.0359	0.06	0.07	-0.01	0.06	164.86	71.31	153.85	106.73	0.64
*Q1	0.0372	0.05	0.06	0.00	0.08	87.77	133.92	21.02	92.56	0.87
*RHO1	0.0374	0.06	0.07	0.04	0.06	3.52	84.93	223.96	128.46	0.68
*O1	0.0387	0.22	0.09	-0.02	0.07	33.70	20.49	91.29	28.38	5.98
*TAU1	0.0390	0.15	0.11	0.00	0.08	6.72	30.93	57.48	51.39	1.77
*BET1	0.0400	0.06	0.05	-0.00	0.07	118.18	107.85	42.45	84.46	1.15
*NO1	0.0403	0.04	0.06	0.00	0.05	48.19	84.96	103.89	103.31	0.49
*CHI1	0.0405	0.10	0.07	-0.03	0.08	137.86	60.71	184.01	59.74	1.90
*P1	0.0416	0.09	0.08	-0.03	0.08	58.35	84.91	110.36	71.57	1.41
*K1	0.0418	0.27	0.08	-0.02	0.08	44.60	17.85	137.56	19.03	12.28
*PHI1	0.0420	0.16	0.10	0.05	0.08	25.00	36.87	317.36	48.38	2.40
*THE1	0.0431	0.02	0.06	0.01	0.05	15.83	92.98	145.81	191.44	0.12
*J1	0.0433	0.11	0.09	0.00	0.07	3.64	45.08	174.85	56.42	1.65
*SO1	0.0446	0.07	0.07	-0.01	0.06	169.36	61.33	55.67	95.62	0.85
*OO1	0.0448	0.06	0.05	0.01	0.06	162.99	64.29	220.70	80.98	1.30
*UPS1	0.0463	0.07	0.06	-0.01	0.05	178.07	49.45	213.13	75.22	1.10
*OQ2	0.0760	0.09	0.12	0.04	0.13	159.47	117.08	82.69	106.50	0.58
*EPS2	0.0762	0.04	0.11	0.03	0.10	152.73	125.60	171.04	249.94	0.11
*2N2	0.0775	0.07	0.11	0.05	0.09	63.82	87.49	83.87	155.39	0.35
*MU2	0.0777	0.05	0.11	0.02	0.10	86.84	89.74	251.70	183.74	0.18
*N2	0.0790	0.39	0.12	0.15	0.14	19.95	28.99	205.36	24.31	10.29
*NU2	0.0792	0.12	0.13	0.08	0.11	44.76	117.59	294.10	120.37	0.89
*M2	0.0805	1.66	0.13	0.30	0.15	5.57	6.76	240.86	4.78	175.88
*MKS2	0.0807	0.19	0.13	0.02	0.11	75.98	38.21	213.09	46.96	2.22
*LDA2	0.0818	0.03	0.10	-0.01	0.10	36.21	129.77	200.11	170.72	0.12
*L2	0.0820	0.13	0.11	0.02	0.13	177.69	100.30	41.51	65.79	1.33
*S2	0.0833	0.73	0.11	0.12	0.16	176.50	12.04	70.76	8.92	41.60
*K2	0.0836	0.31	0.12	0.04	0.13	31.81	23.13	271.10	23.21	6.35
*MSN2	0.0848	0.10	0.13	0.05	0.12	92.78	77.23	211.66	112.54	0.64
*ETA2	0.0851	0.09	0.11	0.07	0.10	157.59	134.82	236.85	136.27	0.69
*MO3	0.1192	0.09	0.06	0.00	0.07	38.92	57.69	146.85	55.41	1.89
*M3	0.1208	0.08	0.08	-0.00	0.07	108.36	68.96	106.51	65.70	1.08
*SO3	0.1221	0.09	0.07	0.06	0.06	129.94	82.38	274.53	84.82	1.50
*MK3	0.1223	0.10	0.06	0.04	0.08	12.38	60.11	177.60	49.74	2.75
*SK3	0.1251	0.06	0.06	0.03	0.07	102.01	91.53	287.29	112.58	0.89
*MN4	0.1595	0.05	0.07	0.02	0.06	114.76	97.09	254.38	119.35	0.48
*M4	0.1610	0.04	0.06	0.00	0.06	61.05	108.16	174.34	140.43	0.45
*SN4	0.1623	0.01	0.07	0.00	0.06	75.82	120.22	195.54	211.60	0.03
*MS4	0.1638	0.08	0.08	0.02	0.08	48.79	72.30	314.14	73.92	1.02
*MK4	0.1641	0.11	0.07	0.09	0.07	128.74	95.32	87.09	88.64	2.75
*S4	0.1667	0.06	0.07	0.04	0.07	41.66	106.85	354.37	120.91	0.75
*SK4	0.1669	0.05	0.06	0.02	0.07	161.63	103.60	169.36	100.34	0.85
*2MK5	0.2028	0.04	0.05	0.01	0.04	149.45	103.24	61.85	113.79	0.51
*2SK5	0.2084	0.08	0.05	0.01	0.06	166.17	49.99	160.89	48.10	2.22
*2MN6	0.2400	0.04	0.05	-0.01	0.05	31.14	99.45	85.98	99.16	0.74
*M6	0.2415	0.05	0.06	0.00	0.05	19.59	92.97	111.97	80.15	0.67
*2MS6	0.2444	0.06	0.05	0.03	0.05	104.57	78.59	249.86	71.02	1.53
*2MK6	0.2446	0.07	0.04	0.01	0.05	110.67	59.47	98.67	54.46	2.29
*2SM6	0.2472	0.01	0.04	0.00	0.04	163.31	135.94	247.46	241.50	0.08
*MSK6	0.2474	0.02	0.04	0.00	0.04	134.29	118.82	166.33	165.56	0.17
*3MK7	0.2833	0.04	0.04	0.00	0.04	174.56	90.24	148.70	93.42	0.79
*M8	0.3220	0.03	0.04	-0.00	0.04	158.71	116.77	265.97	124.97	0.46

Percent variance predicted = 21.4% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 3.7. Constituents of the tidal currents at Gato (180 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (�胃)	Error (ꓬ)	Phase (ꓬ)	Error (ꓬ)	SNR
*SSA	0.0002	0.27	0.26	0.04	0.26	90.66	71.73	347.81	76.07	1.08
*MSM	0.0013	0.29	0.25	-0.06	0.27	65.27	73.48	294.62	65.62	1.35
*MM	0.0015	0.35	0.24	0.09	0.27	62.66	64.15	350.61	52.26	2.17
*MSF	0.0028	0.14	0.22	-0.11	0.23	101.89	131.34	317.55	135.30	0.39
*MF	0.0031	0.19	0.21	-0.07	0.23	75.95	105.15	300.30	91.36	0.84
*ALP1	0.0344	0.04	0.07	0.00	0.06	76.30	149.01	70.91	115.13	0.31
*2Q1	0.0357	0.08	0.09	0.02	0.08	29.23	61.01	247.53	93.89	0.75
*SIG1	0.0359	0.07	0.07	0.02	0.06	174.94	62.68	205.57	105.60	0.77
*Q1	0.0372	0.04	0.08	-0.02	0.06	14.26	82.75	109.14	164.02	0.32
*RHO1	0.0374	0.07	0.08	0.02	0.08	133.90	81.33	41.71	83.08	0.80
*O1	0.0387	0.36	0.11	0.06	0.08	7.94	12.77	87.55	19.73	10.52
*TAU1	0.0390	0.09	0.11	0.05	0.08	0.01	73.80	66.61	115.54	0.76
*BET1	0.0400	0.03	0.07	-0.01	0.06	36.57	85.49	15.56	194.40	0.16
*NO1	0.0403	0.05	0.07	0.00	0.05	15.84	65.59	56.04	96.74	0.55
*CHI1	0.0405	0.06	0.07	-0.02	0.08	69.88	98.77	295.38	85.73	0.74
*P1	0.0416	0.11	0.10	0.05	0.08	32.46	65.83	8.87	75.52	1.38
*K1	0.0418	0.39	0.12	-0.06	0.08	8.32	12.82	155.54	18.62	9.79
*PHI1	0.0420	0.11	0.10	0.02	0.07	10.88	47.34	356.33	71.35	1.26
*THE1	0.0431	0.06	0.07	-0.01	0.08	116.45	105.88	255.05	89.86	0.79
*J1	0.0433	0.12	0.11	0.03	0.09	22.33	38.93	177.74	56.07	1.34
*SO1	0.0446	0.06	0.08	-0.00	0.06	1.30	63.73	143.62	121.46	0.57
*OO1	0.0448	0.04	0.06	-0.01	0.04	158.50	78.46	146.45	160.45	0.35
*UPS1	0.0463	0.02	0.06	0.00	0.05	67.17	103.34	350.81	206.49	0.11
*OQ2	0.0760	0.12	0.12	0.04	0.11	130.07	77.18	185.80	68.32	1.02
*EPS2	0.0762	0.06	0.10	0.04	0.10	29.78	97.34	50.84	131.50	0.31
*2N2	0.0775	0.03	0.08	0.01	0.08	89.29	159.15	146.55	164.34	0.13
*MU2	0.0777	0.06	0.08	-0.02	0.08	27.64	103.89	350.82	111.85	0.61
*N2	0.0790	0.32	0.12	0.09	0.11	174.81	20.91	42.29	23.89	6.93
*NU2	0.0792	0.10	0.10	0.00	0.09	9.23	70.67	220.56	82.32	1.07
*M2	0.0805	1.52	0.12	0.17	0.09	177.47	3.72	59.92	4.46	153.56
*MKS2	0.0807	0.10	0.08	-0.04	0.08	140.88	75.51	108.11	73.40	1.48
*LDA2	0.0818	0.10	0.10	0.03	0.09	178.04	68.32	8.89	83.10	1.19
*L2	0.0820	0.10	0.10	0.05	0.09	45.56	92.24	194.45	91.55	1.06
*S2	0.0833	0.61	0.12	0.08	0.10	175.62	10.29	66.26	11.97	26.76
*K2	0.0836	0.25	0.10	0.01	0.09	4.23	22.70	279.02	26.95	6.45
*MSN2	0.0848	0.06	0.10	-0.01	0.08	154.26	94.74	295.01	135.91	0.33
*ETA2	0.0851	0.04	0.08	0.01	0.07	157.35	125.13	48.61	139.30	0.22
*MO3	0.1192	0.05	0.06	0.02	0.05	177.65	79.80	341.97	83.57	0.89
*M3	0.1208	0.05	0.06	-0.02	0.06	31.53	100.13	209.38	111.18	0.60
*SO3	0.1221	0.05	0.05	-0.01	0.06	121.71	88.63	254.70	88.27	1.04
*MK3	0.1223	0.07	0.05	0.05	0.06	160.58	103.86	28.35	114.01	1.64
*SK3	0.1251	0.07	0.05	0.05	0.06	117.99	103.51	356.72	99.81	1.76
*MN4	0.1595	0.06	0.06	-0.02	0.06	118.94	78.95	50.87	78.20	1.13
*M4	0.1610	0.09	0.06	0.03	0.07	113.25	57.59	128.94	60.15	2.16
*SN4	0.1623	0.04	0.06	-0.01	0.05	132.99	114.10	194.40	121.50	0.48
*MS4	0.1638	0.01	0.05	-0.00	0.04	30.88	119.03	184.86	194.23	0.08
*MK4	0.1641	0.08	0.05	0.04	0.06	92.61	78.50	99.35	78.31	2.44
*S4	0.1667	0.08	0.06	0.03	0.05	170.80	58.99	147.95	58.82	2.16
*SK4	0.1669	0.05	0.05	0.01	0.05	125.98	81.95	116.06	88.85	0.98
*2MK5	0.2028	0.04	0.04	0.03	0.05	126.35	114.08	174.63	129.91	0.89
*2SK5	0.2084	0.04	0.05	0.02	0.04	63.49	93.10	41.67	98.24	0.66
*2MN6	0.2400	0.06	0.06	-0.01	0.05	168.37	62.65	285.01	75.33	1.26
*M6	0.2415	0.07	0.05	0.02	0.05	175.64	57.25	335.14	52.08	2.11
*2MS6	0.2444	0.05	0.05	-0.00	0.05	15.98	89.28	202.87	85.53	1.01
*2MK6	0.2446	0.05	0.04	0.02	0.04	36.18	91.45	159.32	91.43	1.32
*2SM6	0.2472	0.02	0.04	0.01	0.04	86.09	133.17	237.33	167.26	0.34
*MSK6	0.2474	0.02	0.04	0.01	0.04	148.10	111.94	224.17	108.86	0.40
*3MK7	0.2833	0.04	0.04	0.01	0.04	8.35	63.55	44.65	76.39	1.05
*M8	0.3220	0.04	0.04	0.03	0.04	42.94	105.63	347.63	98.94	0.95

Percent variance predicted = 20.4% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 3.8. Constituents of the tidal currents at Gato (240 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (⌐)	Error (⌐)	Phase (⌐)	Error (⌐)	SNR
*SSA	0.0002	0.21	0.15	0.03	0.14	1.51	40.67	355.27	43.84	2.19
*MSM	0.0013	0.19	0.12	0.04	0.14	173.85	48.36	79.74	50.84	2.37
*MM	0.0015	0.18	0.13	-0.01	0.14	36.49	60.20	23.71	53.17	1.85
*MSF	0.0028	0.17	0.14	0.02	0.13	165.48	58.32	68.97	51.71	1.44
*MF	0.0031	0.13	0.13	0.00	0.12	69.06	74.98	106.80	69.31	1.08
*ALP1	0.0344	0.07	0.08	0.00	0.06	153.59	46.38	112.70	91.40	0.65
*2Q1	0.0357	0.08	0.09	-0.01	0.07	28.77	49.62	175.03	79.52	0.81
*SIG1	0.0359	0.08	0.08	0.00	0.08	118.80	89.94	238.39	67.62	1.05
*Q1	0.0372	0.05	0.07	0.01	0.06	103.26	135.27	184.17	107.86	0.38
*RHO1	0.0374	0.03	0.08	-0.01	0.05	23.47	53.08	182.10	207.04	0.12
*O1	0.0387	0.38	0.11	0.03	0.06	176.19	8.75	270.32	19.79	11.10
*TAU1	0.0390	0.10	0.12	-0.05	0.07	155.34	56.12	247.17	101.97	0.71
*BET1	0.0400	0.04	0.07	-0.02	0.06	129.72	89.49	303.90	134.12	0.32
*NO1	0.0403	0.02	0.06	0.00	0.04	176.47	57.48	272.30	163.73	0.14
*CHI1	0.0405	0.06	0.09	-0.01	0.05	177.46	44.28	0.62	106.02	0.44
*P1	0.0416	0.11	0.12	0.01	0.06	166.06	36.77	151.48	71.96	0.90
*K1	0.0418	0.41	0.12	-0.03	0.07	170.16	9.72	331.05	16.63	11.19
*PHI1	0.0420	0.17	0.12	-0.01	0.07	178.19	20.22	193.63	52.35	1.91
*THE1	0.0431	0.04	0.07	0.01	0.05	4.33	53.89	11.45	141.43	0.35
*J1	0.0433	0.10	0.12	-0.00	0.05	1.00	35.58	144.88	70.46	0.67
*SO1	0.0446	0.07	0.10	0.03	0.06	2.01	49.17	169.41	114.86	0.52
*OO1	0.0448	0.02	0.06	0.01	0.04	18.58	55.06	3.27	205.30	0.12
*UPS1	0.0463	0.03	0.07	-0.01	0.04	174.08	52.44	130.77	123.94	0.27
*OQ2	0.0760	0.15	0.14	0.04	0.14	20.68	80.32	245.85	72.82	1.12
*EPS2	0.0762	0.08	0.12	0.02	0.10	172.75	91.20	102.04	135.63	0.38
*2N2	0.0775	0.12	0.13	0.03	0.12	25.45	95.97	317.35	107.37	0.79
*MU2	0.0777	0.15	0.12	0.03	0.13	154.85	65.87	203.83	72.68	1.53
*N2	0.0790	0.30	0.16	0.00	0.15	172.48	28.20	33.50	33.92	3.78
*NU2	0.0792	0.11	0.13	0.03	0.10	161.19	78.57	69.67	115.29	0.65
*M2	0.0805	1.40	0.17	-0.22	0.14	165.61	5.96	57.53	5.96	68.72
*MKS2	0.0807	0.24	0.13	0.05	0.11	168.35	32.38	92.48	36.64	3.44
*LDA2	0.0818	0.05	0.10	0.02	0.10	11.40	117.16	295.50	173.99	0.23
*L2	0.0820	0.17	0.13	-0.05	0.12	71.99	69.29	39.20	57.40	1.71
*S2	0.0833	0.59	0.14	-0.07	0.15	178.46	12.72	61.77	15.67	17.80
*K2	0.0836	0.27	0.13	-0.01	0.12	166.08	28.65	96.20	29.08	4.37
*MSN2	0.0848	0.05	0.11	0.04	0.10	133.18	133.62	301.09	167.12	0.17
*ETA2	0.0851	0.06	0.08	0.02	0.10	21.38	100.53	157.62	141.73	0.44
*MO3	0.1192	0.04	0.07	0.02	0.06	123.88	133.55	347.18	165.96	0.27
*M3	0.1208	0.04	0.08	0.03	0.07	35.94	139.38	232.68	166.95	0.26
*SO3	0.1221	0.03	0.06	-0.01	0.05	11.38	124.96	76.01	171.74	0.18
*MK3	0.1223	0.04	0.06	0.00	0.06	93.33	118.23	98.09	136.97	0.36
*SK3	0.1251	0.07	0.07	0.01	0.07	105.09	70.33	7.36	74.96	1.21
*MN4	0.1595	0.07	0.06	0.00	0.07	94.30	59.56	133.54	69.81	1.29
*M4	0.1610	0.04	0.06	-0.01	0.06	31.52	110.67	148.56	124.38	0.47
*SN4	0.1623	0.07	0.07	-0.02	0.06	43.99	80.21	230.43	69.91	1.20
*MS4	0.1638	0.06	0.06	0.02	0.06	18.25	91.33	203.63	84.82	0.86
*MK4	0.1641	0.06	0.05	0.02	0.05	66.30	77.88	198.57	86.26	1.22
*S4	0.1667	0.02	0.05	0.00	0.05	107.37	130.35	27.75	176.27	0.16
*SK4	0.1669	0.03	0.05	0.02	0.05	84.04	112.02	217.96	152.04	0.27
*2MK5	0.2028	0.07	0.06	0.06	0.05	154.46	122.00	206.87	106.68	1.74
*2SK5	0.2084	0.04	0.05	-0.02	0.05	144.80	110.83	166.23	110.84	0.75
*2MN6	0.2400	0.05	0.06	0.01	0.06	142.40	85.11	211.41	108.52	0.65
*M6	0.2415	0.02	0.05	0.02	0.05	94.54	143.36	259.31	190.38	0.19
*2MS6	0.2444	0.08	0.06	-0.03	0.06	150.74	45.71	25.09	52.38	1.94
*2MK6	0.2446	0.05	0.05	0.02	0.05	142.62	75.23	180.13	81.36	0.96
*2SM6	0.2472	0.04	0.05	-0.00	0.05	60.42	111.08	55.86	101.45	0.71
*MSK6	0.2474	0.06	0.05	-0.00	0.05	92.75	65.98	142.75	57.08	1.85
*3MK7	0.2833	0.03	0.05	-0.00	0.05	132.45	111.38	249.16	124.69	0.33
*M8	0.3220	0.05	0.05	-0.00	0.06	162.74	70.38	258.70	72.24	0.96

Percent variance predicted = 16.0% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

Table 3.9. Constituents of the tidal currents at Gato (290 m).

Tide Constituent	Freq. (cph)	Axe Maj. (cm/s)	Error (cm/s)	Axe Min. (cm/s)	Error (cm/s)	Incli. (⅃)	Error (⅃)	Phase (⅃)	Error (⅃)	SNR
*SSA	0.0002	0.15	0.11	-0.06	0.11	144.91	61.61	195.37	60.27	1.82
*MSM	0.0013	0.11	0.10	-0.03	0.09	48.49	73.59	320.64	73.89	1.29
*MM	0.0015	0.14	0.12	0.04	0.11	91.34	62.86	233.54	59.95	1.46
*MSF	0.0028	0.17	0.12	-0.08	0.10	68.66	62.94	21.40	60.65	2.17
*MF	0.0031	0.09	0.09	-0.07	0.10	47.47	127.68	303.47	138.82	0.93
*ALP1	0.0344	0.05	0.13	-0.04	0.07	149.08	65.96	132.65	183.84	0.17
*2Q1	0.0357	0.05	0.13	-0.00	0.07	165.97	42.92	178.32	163.91	0.17
*SIG1	0.0359	0.04	0.11	-0.01	0.06	151.45	51.58	174.35	163.11	0.13
*Q1	0.0372	0.04	0.12	-0.00	0.07	34.72	48.72	25.19	196.25	0.10
*RHO1	0.0374	0.07	0.11	0.04	0.09	135.15	78.65	309.13	133.76	0.40
*O1	0.0387	0.48	0.18	0.01	0.08	164.59	9.63	267.21	20.51	7.39
*TAU1	0.0390	0.14	0.17	0.01	0.09	175.31	29.85	281.49	76.42	0.65
*BET1	0.0400	0.12	0.12	0.00	0.07	161.03	29.15	2.72	85.19	0.95
*NO1	0.0403	0.04	0.10	0.01	0.05	167.34	43.10	353.54	149.19	0.17
*CHI1	0.0405	0.08	0.13	-0.05	0.08	175.02	51.94	350.34	122.95	0.35
*P1	0.0416	0.27	0.16	-0.01	0.10	158.60	20.09	185.64	37.55	2.78
*K1	0.0418	0.60	0.17	-0.07	0.10	162.15	10.00	315.44	17.31	11.86
*PHI1	0.0420	0.30	0.19	-0.04	0.09	165.45	19.79	177.41	35.16	2.44
*THE1	0.0431	0.10	0.12	0.02	0.10	130.04	63.39	43.21	82.10	0.72
*J1	0.0433	0.22	0.18	-0.03	0.09	158.53	23.97	348.98	54.34	1.43
*SO1	0.0446	0.11	0.14	-0.01	0.08	154.13	40.55	11.88	73.69	0.70
*OO1	0.0448	0.05	0.09	-0.01	0.06	155.57	50.13	157.18	151.82	0.35
*UPS1	0.0463	0.04	0.09	0.02	0.06	146.15	62.44	140.05	147.53	0.19
*OQ2	0.0760	0.09	0.11	-0.03	0.11	127.38	92.29	134.31	94.62	0.69
*EPS2	0.0762	0.05	0.09	-0.02	0.08	82.77	91.89	223.06	162.11	0.30
*2N2	0.0775	0.13	0.12	0.02	0.10	130.58	53.98	110.90	60.40	1.24
*MU2	0.0777	0.20	0.10	-0.04	0.11	129.30	39.29	205.30	36.73	3.52
*N2	0.0790	0.09	0.08	-0.04	0.09	128.11	91.60	52.84	88.29	1.15
*NU2	0.0792	0.14	0.09	-0.03	0.12	149.29	58.02	107.26	55.89	2.29
*M2	0.0805	0.84	0.11	-0.05	0.11	154.75	6.99	76.63	7.31	60.95
*MKS2	0.0807	0.11	0.09	-0.04	0.08	50.05	60.09	191.77	56.11	1.63
*LDA2	0.0818	0.05	0.08	0.02	0.07	169.21	122.96	321.22	147.76	0.38
*L2	0.0820	0.15	0.11	0.01	0.10	140.49	44.20	356.24	41.45	2.16
*S2	0.0833	0.38	0.11	-0.02	0.12	146.47	15.10	81.64	15.69	12.04
*K2	0.0836	0.20	0.09	-0.10	0.09	161.43	40.17	105.12	41.36	5.00
*MSN2	0.0848	0.04	0.08	-0.00	0.07	160.13	123.50	241.80	138.08	0.28
*ETA2	0.0851	0.03	0.07	0.01	0.06	108.02	108.53	287.85	158.03	0.22
*MO3	0.1192	0.08	0.08	0.02	0.06	23.16	67.55	318.65	70.30	1.00
*M3	0.1208	0.04	0.06	0.01	0.06	103.04	129.75	321.28	122.78	0.43
*SO3	0.1221	0.05	0.07	0.04	0.05	136.08	108.85	265.78	119.48	0.59
*MK3	0.1223	0.11	0.06	0.06	0.07	94.95	73.40	59.43	64.39	2.90
*SK3	0.1251	0.05	0.06	0.02	0.06	11.49	105.33	40.37	110.21	0.51
*MN4	0.1595	0.06	0.08	0.02	0.07	60.40	92.90	103.75	111.36	0.55
*M4	0.1610	0.10	0.08	0.01	0.07	7.76	64.32	170.63	58.20	1.41
*SN4	0.1623	0.06	0.08	0.01	0.07	18.93	96.82	347.39	95.59	0.68
*MS4	0.1638	0.12	0.09	0.02	0.08	53.85	41.54	151.64	50.05	2.07
*MK4	0.1641	0.11	0.06	0.06	0.07	42.45	67.82	233.41	63.28	3.05
*S4	0.1667	0.08	0.07	-0.01	0.08	115.87	73.69	278.79	69.33	1.23
*SK4	0.1669	0.05	0.08	0.01	0.07	53.17	92.56	222.92	95.97	0.46
*2MK5	0.2028	0.06	0.06	0.01	0.05	128.84	82.13	177.02	80.27	0.77
*2SK5	0.2084	0.03	0.05	0.02	0.05	166.19	131.07	249.40	150.55	0.43
*2MN6	0.2400	0.06	0.05	-0.02	0.06	127.57	73.11	273.03	78.71	1.36
*M6	0.2415	0.05	0.06	0.01	0.05	40.35	83.96	158.27	92.77	0.81
*2MS6	0.2444	0.03	0.05	-0.01	0.05	14.07	107.46	48.57	129.28	0.45
*2MK6	0.2446	0.04	0.05	0.01	0.04	112.75	101.36	211.11	99.66	0.67
*2SM6	0.2472	0.04	0.04	-0.01	0.05	71.52	105.27	225.92	111.90	0.72
*MSK6	0.2474	0.05	0.05	0.02	0.04	176.84	82.35	86.94	79.63	1.01
*3MK7	0.2833	0.08	0.06	-0.02	0.06	58.85	49.18	15.45	55.78	1.85
*M8	0.3220	0.03	0.05	0.00	0.05	88.22	92.48	157.12	119.41	0.43

Percent variance predicted = 11.0% (only significants constituents)

Constituent, Frequency major and minor axes, ellipse orientation (anticlockwise from east), constituent phases (degrees relative to Greenwich) and signal to noise ratio. The stars to indicate the constituents used in the prediction of tidal current (snr >= 0). The errors for each parameter are estimated with a 95% confidence level.

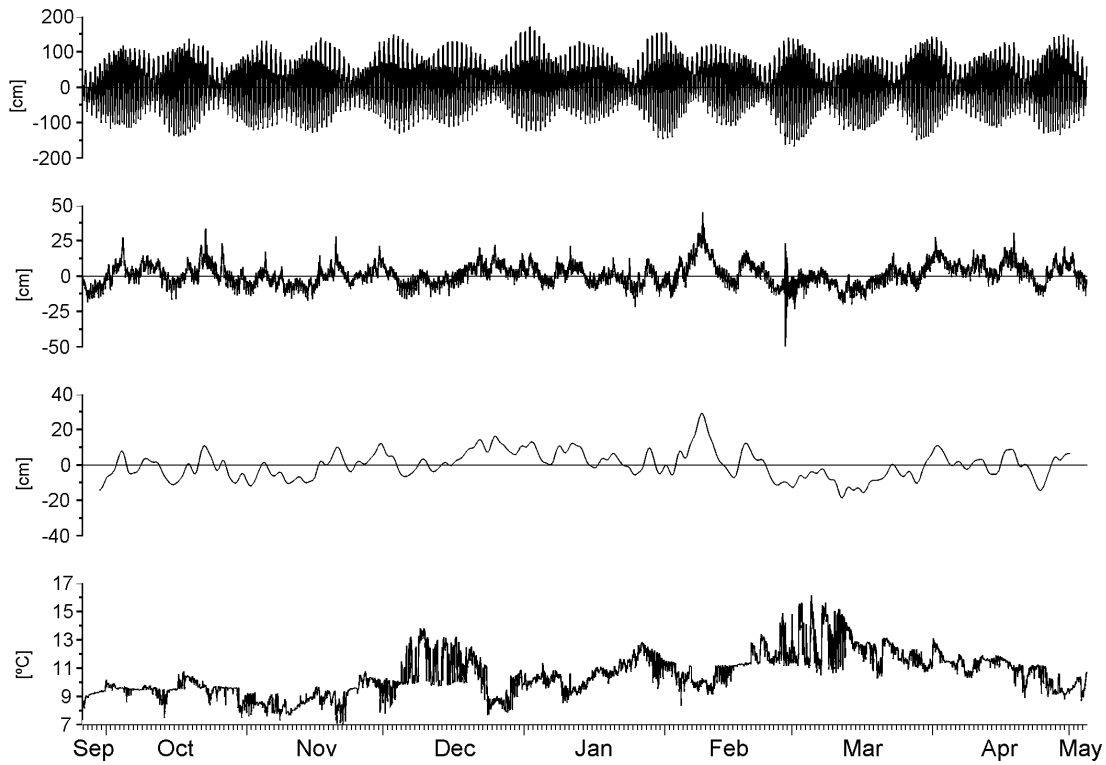# II) NIVEL DE MAR

1) Punta Contreras

Figure 4.1. Sea level anomaly, residuals, sea level filtered and temperature. Location Punta Contreras.

Table 4.1. Statistics of sea level and temperature. Location Punta Contreras.

	Mean	Std	Max	Min
Temperature (°C)	11.48	1.43	16.14	7.07
Sea Level anomaly (cm)	—	63.19	171.66	-166.58

Table 4.2 Constituents of sea level tides measurement in Punta Contreras.

Tide Constituent	Freq. (cph)	Amplitude (cm)	Error (cm)	Phase (°)	Error (°)	SNR
*SSA	0.0002	5.14	3.69	202.03	40.23	1.93
*MSM	0.0013	0.56	2.55	345.28	205.29	0.05
*MM	0.0015	1.26	2.67	174.63	142.26	0.22
*MSF	0.0028	1.32	2.66	124.44	147.52	0.24
*MF	0.0031	3.64	3.69	128.61	59.82	0.97
*ALP1	0.0344	0.10	0.21	7.85	137.36	0.24
*2Q1	0.0357	0.25	0.30	325.81	74.12	0.70
*SIG1	0.0359	0.49	0.30	21.89	36.13	2.79
*Q1	0.0372	2.57	0.34	12.21	6.77	55.59
*RHO1	0.0374	0.71	0.27	1.95	23.25	6.72
*O1	0.0387	13.74	0.31	32.50	1.14	1971.33
*TAU1	0.0390	0.39	0.33	140.90	49.46	1.36
*BET1	0.0400	0.32	0.26	227.49	53.35	1.57
*NO1	0.0403	1.36	0.24	49.06	10.01	31.22
*CHI1	0.0405	0.20	0.26	59.44	84.07	0.60
*P1	0.0416	5.96	0.31	72.15	3.21	363.49
*K1	0.0418	19.54	0.29	75.23	0.87	4574.85
*PHI1	0.0420	0.42	0.33	99.82	45.79	1.67
*THE1	0.0431	0.14	0.22	109.27	98.62	0.45
*J1	0.0433	1.09	0.31	92.57	18.36	12.63
*SO1	0.0446	0.29	0.27	65.54	55.22	1.16
*OO1	0.0448	0.54	0.26	178.63	28.15	4.29
*UPS1	0.0463	0.18	0.24	186.59	86.55	0.54
*OQ2	0.0760	0.42	0.56	143.64	89.30	0.58
*EPS2	0.0762	0.30	0.51	140.40	110.41	0.33
*2N2	0.0775	2.62	0.64	120.79	13.15	16.85
*MU2	0.0777	1.66	0.59	129.57	20.22	7.97
*N2	0.0790	18.51	0.59	131.40	1.76	997.37
*NU2	0.0792	4.01	0.51	132.37	7.23	61.37
*M2	0.0805	77.29	0.57	158.39	0.47	18641.58
*MKS2	0.0807	1.47	0.52	225.15	17.08	8.07
*LDA2	0.0818	1.22	0.54	121.11	24.14	5.11
*L2	0.0820	4.10	0.53	143.01	8.05	59.22
*S2	0.0833	28.46	0.57	170.68	1.03	2496.67
*K2	0.0836	8.57	0.50	172.34	3.03	288.44
*MSN2	0.0848	0.82	0.61	0.72	39.20	1.83
*ETA2	0.0851	0.39	0.43	207.35	74.48	0.82
*MO3	0.1192	0.23	0.12	51.34	32.50	3.59
*M3	0.1208	0.27	0.15	142.01	29.73	3.33
*SO3	0.1221	0.04	0.09	68.86	162.64	0.17
*MK3	0.1223	0.04	0.10	186.72	149.41	0.18
*SK3	0.1251	0.11	0.13	317.77	73.31	0.76
*MN4	0.1595	0.83	0.30	59.73	19.96	7.75
*M4	0.1610	1.70	0.26	91.11	10.42	42.47
*SN4	0.1623	0.20	0.26	119.76	71.35	0.60
*MS4	0.1638	1.54	0.27	97.72	10.59	33.55
*MK4	0.1641	0.30	0.23	133.28	49.87	1.66
*S4	0.1667	0.27	0.24	228.87	59.60	1.18
*SK4	0.1669	0.38	0.27	179.77	38.23	1.96
*2MK5	0.2028	0.20	0.14	33.03	41.69	2.02
*2SK5	0.2084	0.30	0.13	265.11	27.93	5.43
*2MN6	0.2400	0.34	0.14	22.63	24.90	5.59
*M6	0.2415	0.48	0.12	42.88	16.13	16.64
*2MS6	0.2444	0.52	0.12	69.32	15.31	19.37
*2MK6	0.2446	0.12	0.11	54.58	55.30	1.18
*2SM6	0.2472	0.21	0.14	84.89	36.08	2.20
*MSK6	0.2474	0.06	0.10	105.41	119.41	0.35
*3MK7	0.2833	0.04	0.05	274.12	78.17	0.66
*M8	0.3220	0.15	0.10	65.70	45.60	2.18
*M10	0.4026	0.19	0.12	55.97	32.73	2.33

Percent variance predicted = 98.5 (only significants constituents).

Frequency, constituent, amplitude, constituent phases (degrees relative to Greenwich) and signal to noise ratio. The asterisks to indicate the constituents used in the prediction of tides current (snr > 0). The error for each parameters are estimated with 95% confidence intervals.
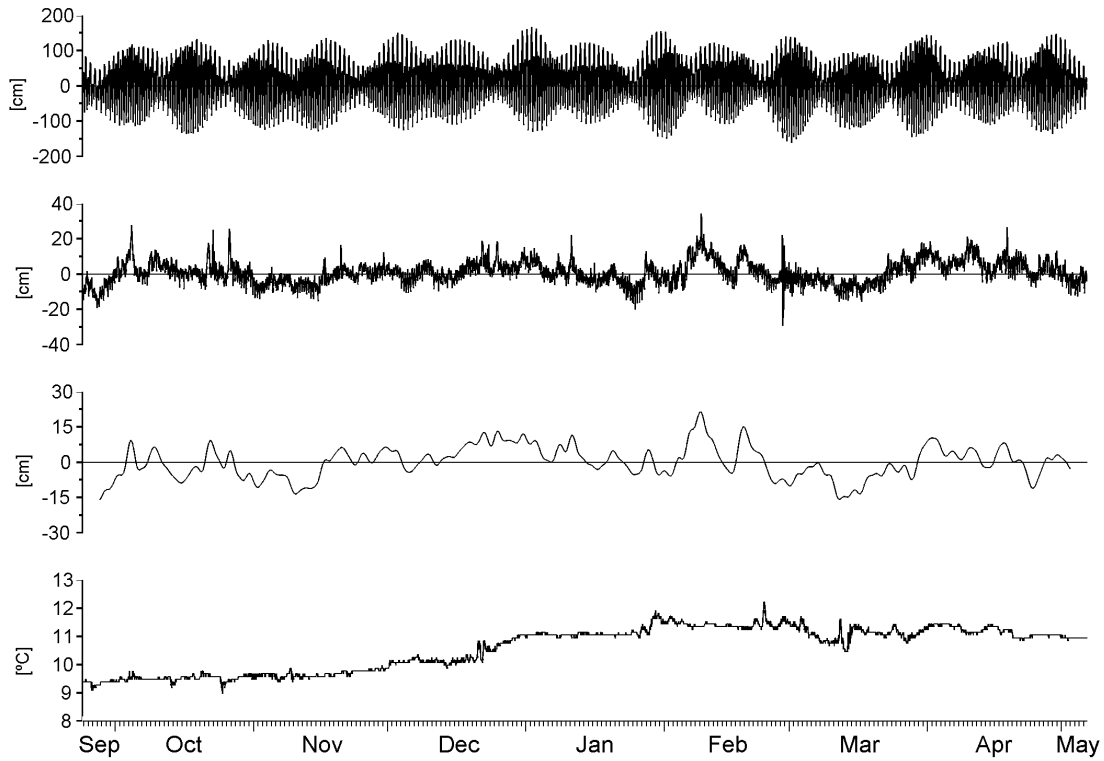
2) Caleta Gato

Figure 5.1. Sea level anomaly, residuals, sea level filtered and temperature. Location Caleta Gato.

Table 5.1. Statistics of sea level and temperature. Location Caleta Gato.

	Mean	Std	Max	Min
Temperature (ºC)	10.57	0.76	12.21	8.98
Sea Level anomaly (cm)	—	63.09	166.37	-161.78

Table 5.2 Constituents of sea level tides measurement in Caleta Gato.

Tide Constituent	Freq. (cph)	Amplitude (cm)	Error (cm)	Phase (°)	Error (°)	SNR
*SSA	0.0002	3.94	2.94	203.90	52.19	1.79
*MSM	0.0013	0.63	2.46	329.17	191.84	0.07
*MM	0.0015	1.17	2.66	190.54	128.47	0.19
*MSF	0.0028	1.22	2.61	130.69	129.48	0.22
*MF	0.0031	3.10	3.35	125.92	56.72	0.86
*ALP1	0.0344	0.09	0.20	9.90	150.42	0.22
*2Q1	0.0357	0.30	0.27	323.77	58.42	1.16
*SIG1	0.0359	0.54	0.28	14.76	32.49	3.73
*Q1	0.0372	2.51	0.29	13.26	7.94	77.11
*RHO1	0.0374	0.66	0.21	7.53	23.37	9.78
*O1	0.0387	13.94	0.27	31.86	1.27	2708.62
*TAU1	0.0390	0.49	0.31	107.75	34.27	2.55
*BET1	0.0400	0.03	0.17	252.85	206.39	0.03
*NO1	0.0403	1.26	0.26	42.95	9.90	23.80
*CHI1	0.0405	0.28	0.20	53.98	55.08	2.03
*P1	0.0416	5.98	0.29	73.32	2.51	418.18
*K1	0.0418	19.78	0.32	75.81	0.82	3874.33
*PHI1	0.0420	0.21	0.26	50.14	80.33	0.67
*THE1	0.0431	0.15	0.22	122.82	104.59	0.44
*J1	0.0433	1.16	0.29	90.19	15.05	16.41
*SO1	0.0446	0.28	0.24	55.06	50.07	1.31
*OO1	0.0448	0.61	0.22	183.92	19.24	7.65
*UPS1	0.0463	0.20	0.21	197.74	66.47	0.83
*OQ2	0.0760	0.39	0.56	134.87	81.15	0.49
*EPS2	0.0762	0.32	0.44	128.67	99.68	0.55
*2N2	0.0775	2.65	0.56	120.07	11.89	22.41
*MU2	0.0777	1.60	0.50	130.13	18.13	10.17
*N2	0.0790	18.57	0.55	131.43	1.77	1120.63
*NU2	0.0792	4.13	0.56	130.62	7.99	54.21
*M2	0.0805	77.75	0.60	158.47	0.37	16793.48
*MKS2	0.0807	1.30	0.49	228.30	20.42	7.06
*LDA2	0.0818	1.19	0.46	127.15	24.45	6.79
*L2	0.0820	4.17	0.54	143.04	8.04	59.72
*S2	0.0833	28.64	0.54	170.78	1.21	2859.54
*K2	0.0836	8.52	0.45	172.08	3.22	357.78
*MSN2	0.0848	0.90	0.61	358.85	36.94	2.17
*ETA2	0.0851	0.47	0.53	204.97	50.59	0.80
*MO3	0.1192	0.26	0.13	51.80	28.34	3.69
*M3	0.1208	0.29	0.14	146.01	27.24	4.05
*SO3	0.1221	0.06	0.10	57.11	109.23	0.30
*MK3	0.1223	0.08	0.11	150.69	87.73	0.55
*SK3	0.1251	0.10	0.11	339.29	78.43	0.90
*MN4	0.1595	0.81	0.26	61.02	18.97	9.63
*M4	0.1610	1.67	0.26	93.26	9.87	42.58
*SN4	0.1623	0.19	0.22	117.70	64.31	0.72
*MS4	0.1638	1.53	0.25	100.48	8.99	36.90
*MK4	0.1641	0.31	0.23	127.84	46.16	1.89
*S4	0.1667	0.25	0.24	228.50	60.43	1.01
*SK4	0.1669	0.36	0.21	180.38	35.44	2.97
*2MK5	0.2028	0.17	0.13	33.84	41.14	1.79
*2SK5	0.2084	0.28	0.13	263.79	24.70	4.91
*2MN6	0.2400	0.31	0.13	21.80	24.15	5.55
*M6	0.2415	0.46	0.12	40.90	15.45	15.58
*2MS6	0.2444	0.49	0.12	69.23	15.10	15.92
*2MK6	0.2446	0.11	0.11	52.92	51.90	1.01
*2SM6	0.2472	0.18	0.12	83.44	39.17	2.29
*MSK6	0.2474	0.05	0.09	112.22	109.82	0.30
*3MK7	0.2833	0.04	0.05	275.87	73.50	0.81
*M8	0.3220	0.13	0.08	66.32	33.68	2.56

Percent variance predicted = 99.0 (only significants constituents)

Frequency, constituent, amplitude, constituent phases (degrees relative to Greenwich) and signal to noise ratio. The asterisks to indicate the constituents used in the prediction of tides current (snr > 1). The error for each parameters are estimated with 95% confidence intervals.
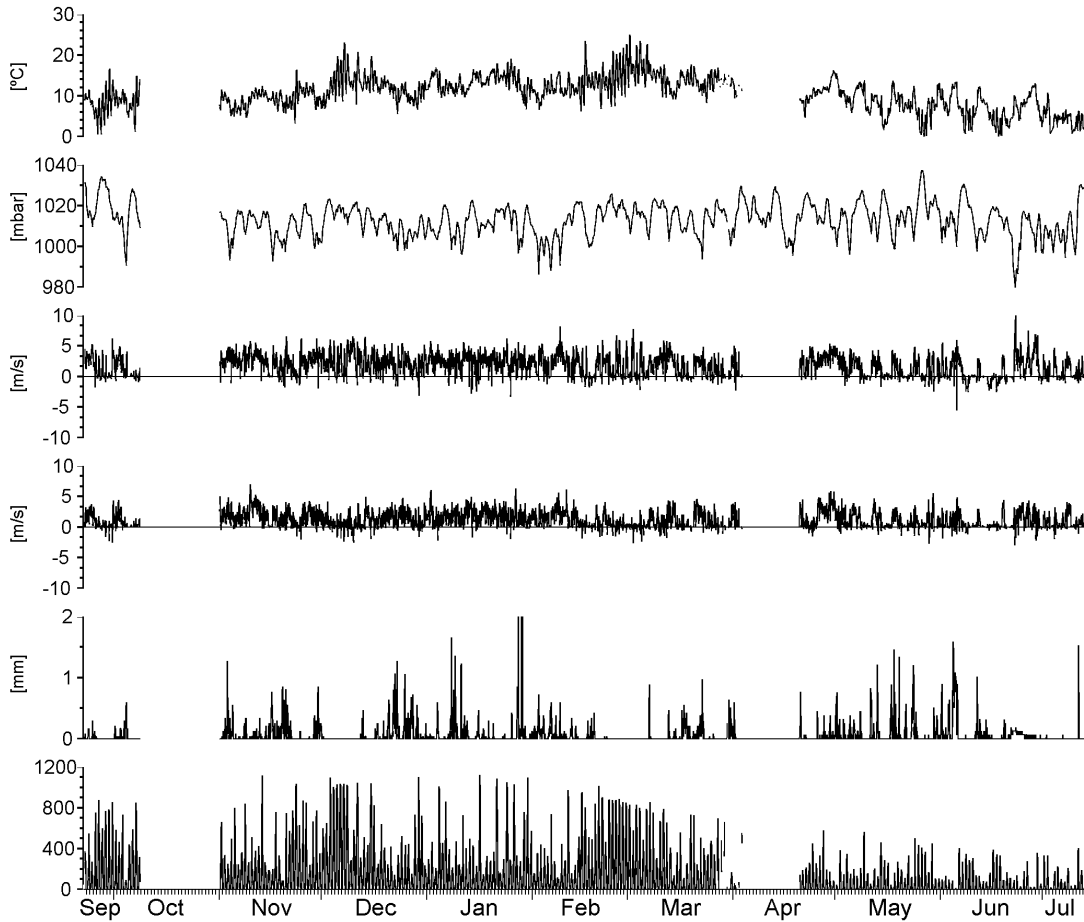
III) METEOROLOGIA

Figure 6.1 Hourly average of temperature, atmospheric pressure, components u and v of wind speed, rain, and solar radiation measured at the meteorological station located in Puerto Chacabuco.

Table 6.1 Statistics of variables measured at the meteorological station located in Puerto Chacabuco.

Variable	Mean	Max	Min	Std
Magnitude (m/s)	2.23	10.70	0.00	1.89
U (m/s)	1.62	10.70	-3.60	1.72
V (m/s)	0.86	8.68	-8.10	1.50
Air temperature (ºC)	10.65	25.40	0.00	3.89
Atmospheric pressure (mbar)	1012.54	1037.50	979.10	7.98
Rain (mm)	0.08	61.98?	0.00	1.38
Solar radiation	114.86	1492.00	0.00	208.77

ANEXO A1

Table A1. Distance from head ADCP to first bin, size bin, total bins, time interval measurement, angle of maximum variance (average all columns measurement) with respect to geographic north (to east values are positive), width of interpolated cell and the range where the measurements were valid.

Instrument	Location	Distance Bin 1 (m)	Size Bin (m)	Total Bins	Sampling interval (min)	Angle (°)	Interpolated cell (m)	Range (m)
ADCP WH600 kHz	Cuervo	1.61	0.5	80	20	136	0.5	[2-29]
ADCP WH300 kHz	Gato	3.21	1	40	20	114	1	[2-25]
ADCP LR75 kHz	Gato	16.73	8	44	20	114	10	[20-290]

ANEXO A2

ADCP 600 kHz
(ns 6519)

33.5 m

35.5 m

43.0 m

Boya Plástica 14"

45.0 m

195.0 m

Boya Vidrio 17"

196.5 m

Release
(ns 602)

198.0 m

214.0 m

Profundidad: 218.0 m

Lat : 45º 22.750' S
Lon: 73º 04.350' W
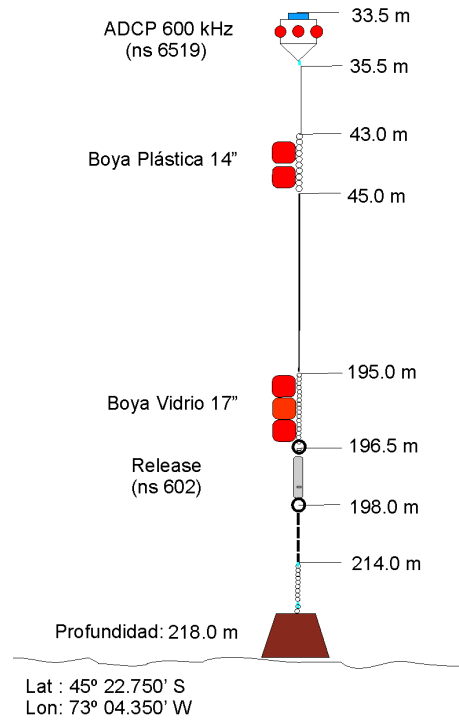
Figure A2.1. Mooring design. Location Cuervo

ADCP 300 kHz
(ns 2999)

31.5 m

33.5 m

53.5 m

Boya Plástica 14"

56.5 m

306.5 m

ADCP LR 75 kHz

308.5 m

Boya Vidrio 17"

312.5 m

Release
(ns 601)
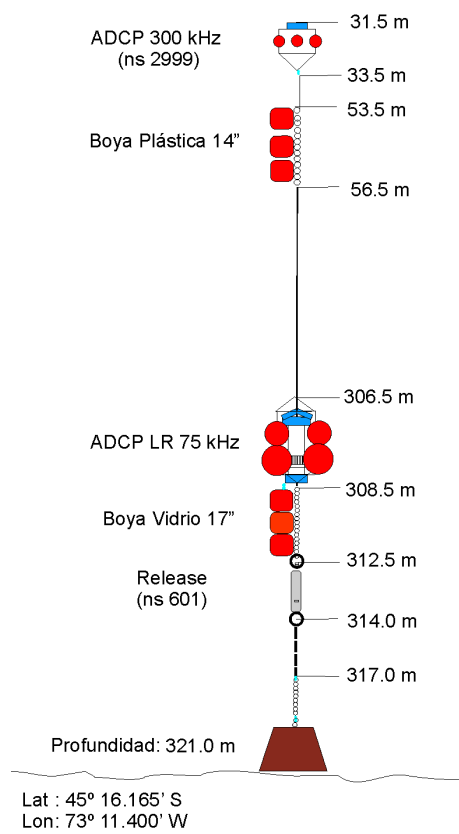
314.0 m

317.0 m

Profundidad: 321.0 m

Lat : 45º 16.165' S
Lon: 73º 11.400' W

Figure A2.2. Mooring design. Location Gato.