APPENDIX TO:

NEAR REAL-TIME FILTERING OF HIGH PRECISION BOREHOLE STRAINMETER SIGNALS FOR VOLCANO SURVEILLANCE

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Appendix A

In this appendix, the values of the filter parameters estimated from the *training signal* are presented for the different analyzed sampling times. In particular, the tidal factors A_m and B_m are shown in Table A1 while the weights b_k of the FIR filter are presented in Table A2, respectively.

Table A1 – Values of the tidal factors A_m and B_m estimated from the *training signal* sampled at $t_c = 1$ h ($q = 1$ and $D_{min,opt} = 0.03$), $t_c = 10$ min ($q = 5$ and $D_{min,opt} = 0.95$) and $t_c = 5$ min ($q = 10$ and $D_{min,opt} = 0.91$).

Tidal groups	$t_c = 1$ h		$t_c = 10$ min		$t_c = 5$ min	
	A_m [counts]	B_m [counts]	A_m [counts]	B_m [counts]	A_m [counts]	B_m [counts]
Q1	-114.41	-0.83	-114.93	-1.08	-112.27	-1.21
O1	-114.18	-0.42	-114.91	-0.55	-112.17	-0.95
M1	-108.05	0.82	-108.75	0.90	-107.66	0.05
P1S1K1	-101.92	2.34	-102.72	2.51	-103.20	1.15
J1	-102.57	2.48	-103.53	2.56	-103.55	1.17
OO1	-102.93	2.48	-103.94	2.56	-103.73	1.16
2N2	-95.87	4.20	-95.74	6.53	-95.96	4.08
N2	-96.61	4.07	-96.13	6.64	-96.28	4.15
M2	-96.53	1.56	-96.60	4.54	-96.68	2.43
L2	-95.35	-2.43	-97.20	0.90	-96.98	-1.74
S2K2	-93.94	-6.48	-97.51	-3.09	-97.18	-6.01
M3	-58.00	13.80	-64.67	16.42	-66.88	7.89

Table A2 – Values of the weights b_k of the FIR applied to the recorded atmospheric pressure signal, p, estimated from the *training signal* sampled at $t_c = 1$ h ($q = 1$ and $D_{min,opt} = 0.03$), $t_c = 10$ min ($q = 5$ and $D_{min,opt} = 0.95$) and $t_c = 5$ min ($q = 10$ and $D_{min,opt} = 0.91$).

FIR coefficient [counts/millibar]	$t_c = 1$h	$t_c = 10$ min	$t_c = 5$ min
b_0	656.5	782.5	772.4
b_1	-140.9	-55.9	-27.0
b_2	-	-45.0	-19.9
b_3	-	-48.1	-32.7
b_4	-	-17.6	-28.7
b_5	-	-23.6	-26.0
b_6	-	-	-23.1
b_7	-	-	-22.6
b_8	-	-	-8.8
b_9	-	-	-4.1
b_{10}	-	-	-19.0

Appendix B

In this appendix, the values of the filter parameters estimated from the *testing signal* are presented for the different analyzed sampling times. In particular, the tidal factors A_m and B_m are shown in Table B1 while the weights b_k of the FIR filter are presented in Table B2, respectively.

Table B1 – Values of the tidal factors A_m e B_m estimated from the *testing signal* sampled at $t_c = 1$ h ($q = 1$ and $D_{min,opt} = 0.37$), $t_c = 10$ min ($q = 6$ and $D_{min,opt} = 0.37$) and $t_c = 5$ min ($q = 14$ and $D_{min,opt} = 0.64$).

Tidal groups	$t_c = 1$ h		$t_c = 10$ min		$t_c = 5$ min	
	A_m [counts]	B_m [counts]	A_m [counts]	B_m [counts]	A_m [counts]	B_m [counts]
Q1	-111.75	16.29	-116.94	-1.90	-111.62	-4.76
O1	-118.76	9.82	-117.36	-2.72	-111.65	-5.06
M1	-108.77	-7.02	-107.80	-5.03	-105.44	-6.34
P1S1K1	-97.49	3.73	-98.17	-7.37	-99.15	-7.54
J1	-121.46	9.10	-99.14	-7.24	-99.24	-7.49
OO1	-115.72	0.56	-99.13	-7.33	-99.23	-7.51
2N2	-86.39	17.32	-95.07	4.68	-95.41	2.96
N2	-91.57	24.49	-95.50	5.07	-95.46	3.04
M2	-91.29	24.36	-95.32	4.77	-95.40	2.67
L2	-89.20	19.99	-96.00	1.84	-94.27	-2.58
S2K2	-92.33	18.34	-97.69	-0.69	-93.12	-7.90
M3	-19.48	14.86	-26.58	8.26	-29.42	7.33

Table B2 – Values of the weights b_k of the FIR applied to the recorded atmospheric pressure signal, p, estimated from the *testing signal* sampled at $t_c = 1$ h ($q = 1$ and $D_{min,opt} = 0.37$), $t_c = 10$ min ($q = 6$ and $D_{min,opt} = 0.37$) and $t_c = 5$ min ($q = 14$ and $D_{min,opt} = 0.64$).

FIR coefficient [counts/millibar]	$t_c = 1$h	$t_c = 10$ min	$t_c = 5$ min
b_0	681.02	755.05	729.33
b_1	-150.48	-39.08	-7.09
b_2	-	-53.48	-24.50
b_3	-	-42.00	-29.32
b_4	-	-30.85	-34.32
b_5	-	-19.44	-28.52
b_6	-	-23.40	-24.37
b_7	-	-	-22.84
b_8	-	-	-16.86
b_9	-	-	-18.49
b_{10}	-	-	-12.45
b_{11}	-	-	-14.74
b_{12}	-	-	-8.51
b_{13}	-	-	-5.63
b_{14}	-	-	-12.17