



Caractérisation des ambiances urbaines par des indicateurs non réglementaires (MEDISOV – Partie 2)

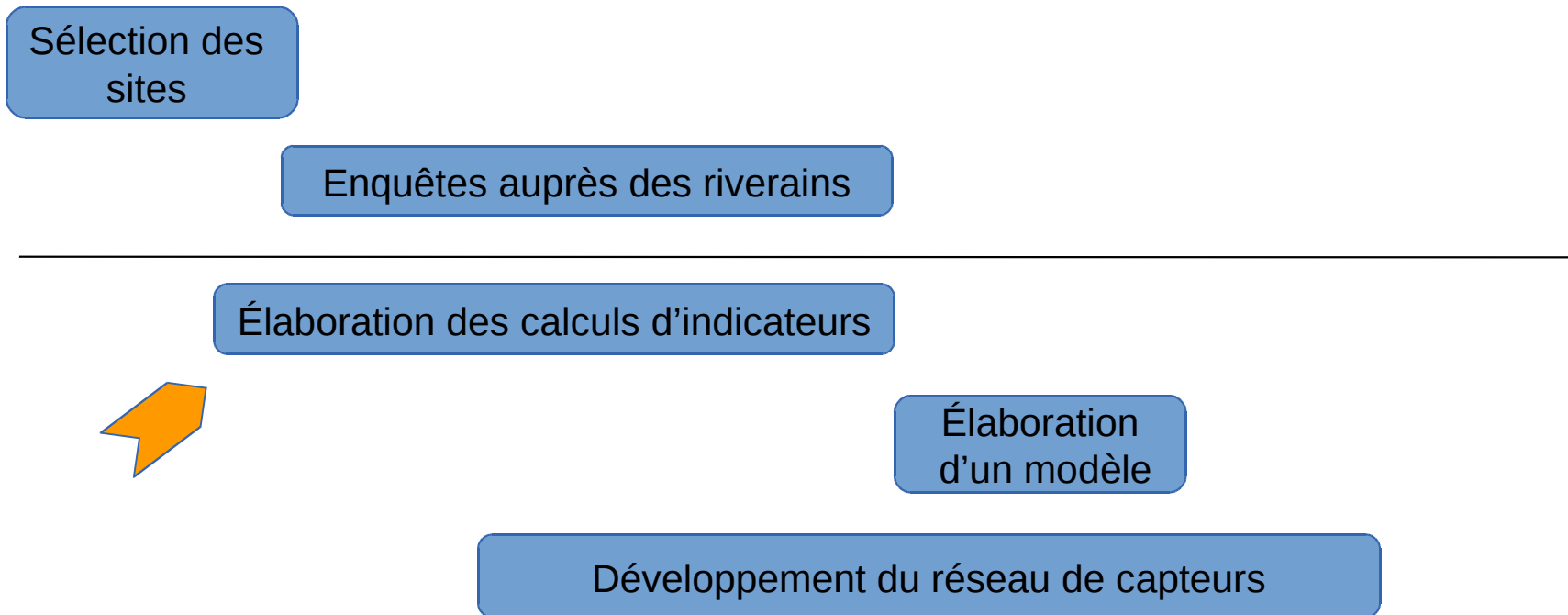
Jean-Pierre Deparis
CEREMA / Dter NP / BEE / AB

Objectif de l'étude :

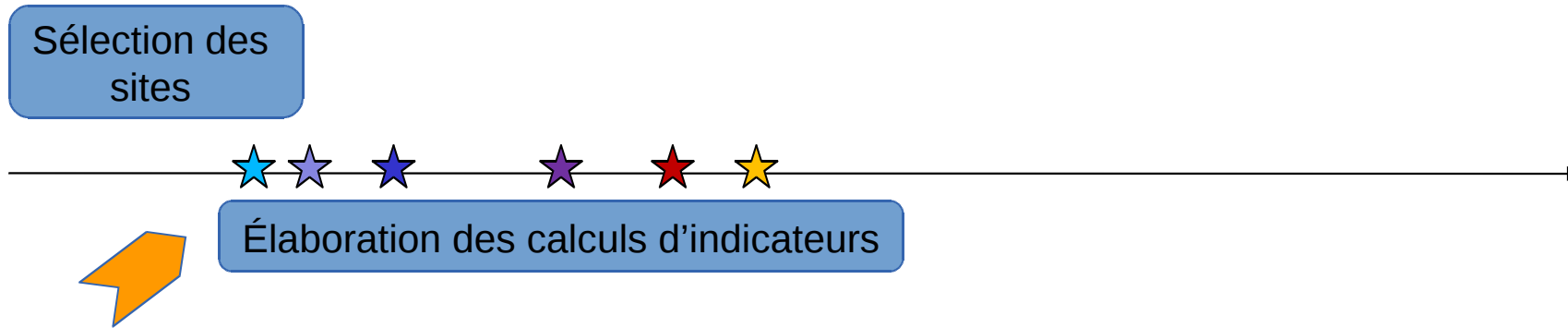
- Définir
- Calculer
- Permettre l'évaluation

d'**indicateurs acoustiques non réglementaires**

Phasage de l'étude (et par rapport au projet)



Phasage de l'étude



- ★ Appropriation des sites
- ★ 1^{ère} campagne d'enregistrements ciblés
- ★ Élaboration du calcul des indicateurs
- ★ Campagne "longue durée" 24 ou 48h
- ★ Calculs
- ★ Analyse des résultats

« Limites » de l'étude

Démarche pragmatique et progressive

Obtenir et tester les indicateurs proposés

A priori : bon indicateur = différenciation

mais future corrélation / Enquêtes

Pas d'optimisation des temps de calcul,
beaucoup de manipulations (modules)

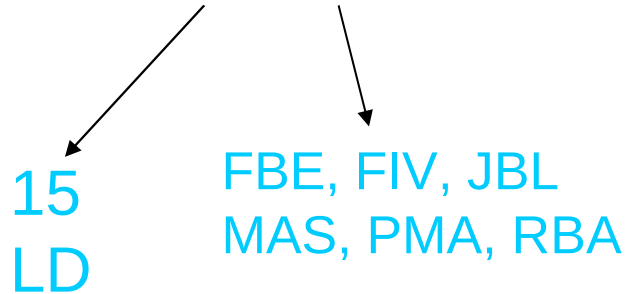
mais souplesse pour l'analyse

Données d'entrée :

Leq(1s) spectraux (octaves de 31 Hz à 8 kHz, Laeq)

Séquences de 960 secondes (960 lignes et 10 colonnes)

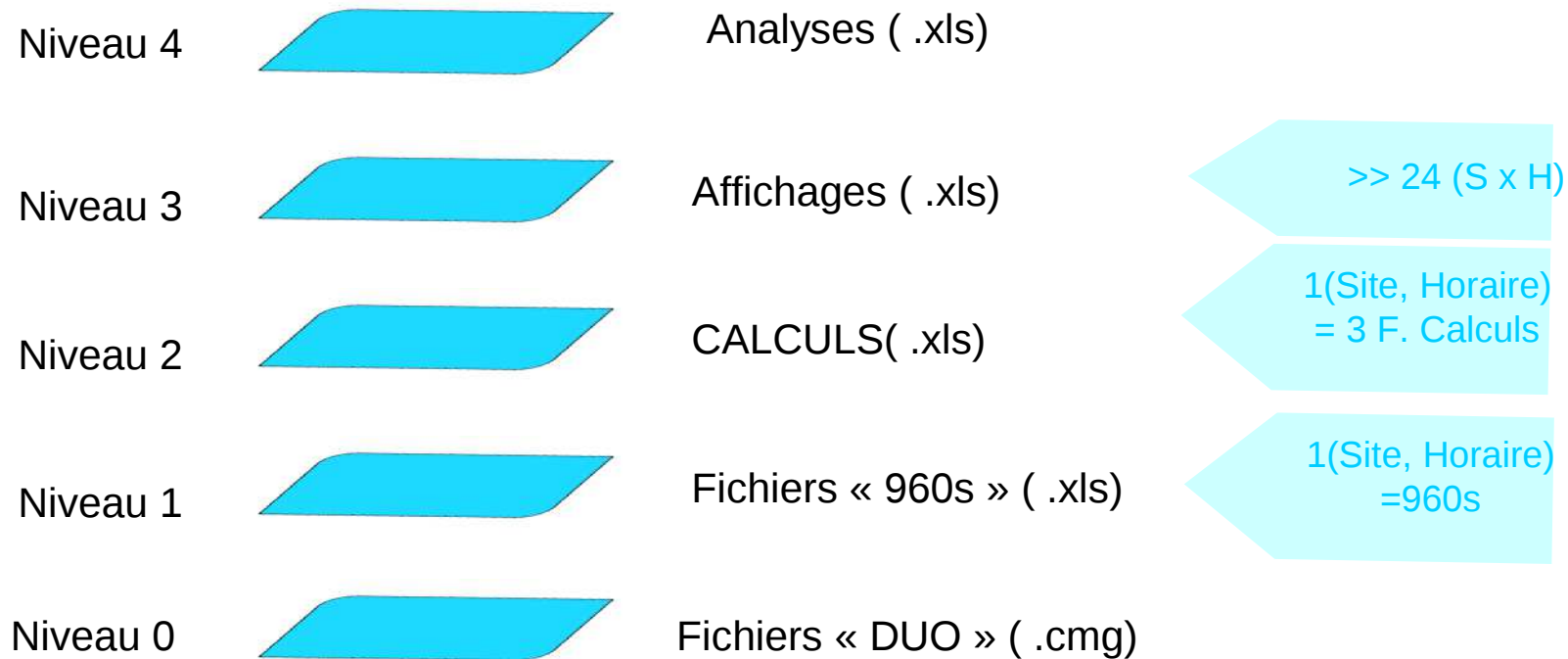
Traçabilité (cmg) et Nomenclature TT-SIT-MMJJ-hhmm



15
LD

FBE, FIV, JBL
MAS, PMA, RBA

Architecture



Niveau 0 : fichiers sonomètres

dBTrait : export des octaves 31 Hz à 8 kHz(+ LAeq)

	A	B	C	D	E	F	G	H	I	J	K	L
1	01dBLeqData	Fichier	20151208_114646	000000.CMG								
2	Début	08/12/2015 13:30										
3	Fin	08/12/2015 13:46						01dBLeqData	Fichier	20151208_114646	000000.CMG	
4	Par périodes de	00:00:01						Début	08/12/2015 13:30			
5	Nombre de voies	6						Fin	08/12/2015 13:46			
6	Voie 1	DUO_4 Leq A dB						Par périodes de	00:00:01			
7	Voie 2	DUO_4 Oct 31.5Hz dB						Nombre de voies	4			
8	Voie 3	DUO_4 Oct 63Hz dB						Voie 1	DUO_4 Oct 1kHz dB			
9	Voie 4	DUO_4 Oct 125Hz dB						Voie 2	DUO_4 Oct 2kHz dB			
10	Voie 5	DUO_4 Oct 250Hz dB						Voie 3	DUO_4 Oct 4kHz dB			
11	Voie 6	DUO_4 Oct 500Hz dB						Voie 4	DUO_4 Oct 8kHz dB			
12												
13	Début période	Voie 1	Voie 2	Voie 3	Voie 4	Voie 5	Voie 6	Début période	Voie 1	Voie 2	Voie 3	Voie 4
14	08/12/2015 13:30	54.1	60.6	62.1	53.9	50.8	49.9	08/12/2015 13:30	49.7	46.8	42.6	40.9
15	08/12/2015 13:30	53.5	56.8	64	54.7	49	49.3	08/12/2015 13:30	48.6	46.6	42.2	39
16	08/12/2015 13:30	54.3	64	65.2	57.4	50.4	50.8	08/12/2015 13:30	49.2	47.1	42.3	37.8
17	08/12/2015 13:30	54.1	67.1	62.2	55.9	50	50.3	08/12/2015 13:30	49.4	46.9	43.1	39
18	08/12/2015 13:30	55.4	61.5	60.3	56	50.9	50.9	08/12/2015 13:30	51.3	48.2	44.6	40.3
19	08/12/2015 13:30	57.2	66.6	64.7	56	52.2	53.9	08/12/2015 13:30	52.6	50	45.9	40.1
20	08/12/2015 13:30	56.7	63.3	65.2	56.9	52.9	52.9	08/12/2015 13:30	52.7	49.2	43.9	39.4
21	08/12/2015 13:30	57.9	65.9	64	56.4	53.2	53.1	08/12/2015 13:30	54.7	50.1	44.9	41.8
22	08/12/2015 13:30	57.8	67.2	63.3	57.7	51.7	53.2	08/12/2015 13:30	54.5	50	45.2	39.9
23	08/12/2015 13:30	58.7	68.9	60.9	57.5	53	55.5	08/12/2015 13:30	55.5	49.9	45.5	41.5
24	08/12/2015 13:30	58.6	67.5	64.5	57.4	53	54.6	08/12/2015 13:30	55.5	49.2	46.8	44.2
25	08/12/2015 13:30	59.2	70.7	64.9	58	54.9	55.5	08/12/2015 13:30	55.9	50.3	46.9	43.2
26	08/12/2015 13:30	60.4	67	64.5	60.6	55	56.5	08/12/2015 13:30	57.5	50.7	47.7	43.6
27	08/12/2015 13:30	61.1	72.3	64.7	61	56.1	57.6	08/12/2015 13:30	58.2	51.1	47.4	42.4
28	08/12/2015 13:30	61.8	73.1	64.5	63	56	58	08/12/2015 13:30	59.1	51.8	47.9	42.9
29	08/12/2015 13:30	62.1	70.7	66	61.7	57.6	59.2	08/12/2015 13:30	59	51.9	48.4	43.7
30	08/12/2015 13:30	62.1	73.2	67.8	63.4	58	59	08/12/2015 13:30	58.8	52	49.1	44.5
31	08/12/2015 13:30	63.3	71	70	63.1	59.5	60.8	08/12/2015 13:30	59.8	53.1	50	46.1
32	08/12/2015 13:30	64.4	72	70.4	65.1	60.6	61.8	08/12/2015 13:30	60.7	54.3	51.2	47.9
33	08/12/2015 13:30	64.4	75.4	72.4	65.8	60.1	61.3	08/12/2015 13:30	61.2	54.2	51.5	48.9
34	08/12/2015 13:30	65.8	73.8	69.7	65.6	60.3	62.2	08/12/2015 13:30	62.8	56.1	52.8	50.2
35	08/12/2015 13:30	66.3	74	72.9	65.4	61.6	61.7	08/12/2015 13:30	63.8	56.1	52.9	49.9
36	08/12/2015 13:30	66.4	72	72.9	66.4	62.2	61.8	08/12/2015 13:30	63.8	56.1	52.9	49.8

Niveau 1 : Fichiers « 960s »

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3												
4												
5												
6												
7												
8												
9	Nom extraction : 20151208_114646_000000.CMG											
10	début période	31.5 Hz	62 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 kHz	Laeq-mes	
11	13:30:00	60.6	62.1	53.9	50.8	49.9	49.2	47.1	42.3	37.8	54.1	
12	13:30:01	56.8	64.0	54.7	49.0	49.3	49.4	46.9	43.1	39.0	53.5	
13	13:30:02	64.0	65.2	57.4	50.4	50.8	51.3	48.2	44.6	40.3	54.3	
14	13:30:03	67.1	62.2	55.9	50.0	50.3	52.6	50.0	45.9	40.1	54.1	
15	13:30:04	61.5	60.3	56.0	50.9	50.9	52.7	49.2	43.9	39.4	55.4	
16	13:30:05	66.6	64.7	56.0	52.2	53.9	54.7	50.1	44.9	41.8	57.2	
17	13:30:06	63.3	65.2	56.9	52.9	52.9	54.5	50.0	45.2	39.9	56.7	
18	13:30:07	65.9	64.0	56.4	53.2	53.1	55.5	49.9	45.5	41.5	57.9	
19	13:30:08	67.2	63.3	57.7	51.7	53.2	55.5	49.2	46.8	44.2	57.8	
20	13:30:09	68.9	60.9	57.5	53.0	55.5	55.9	50.3	46.9	43.2	58.7	
21	13:30:10	67.5	64.5	57.4	53.0	54.6	57.5	50.7	47.7	43.6	58.6	
22	13:30:11	70.7	64.9	58.0	54.9	55.5	58.2	51.1	47.4	42.4	59.2	
23	13:30:12	67.0	64.5	60.6	55.0	56.5	59.1	51.8	47.9	42.9	60.4	
24	13:30:13	72.3	64.7	61.0	56.1	57.6	59.0	51.9	48.4	43.7	61.1	
25	13:30:14	73.1	64.5	63.0	56.0	58.0	58.8	52.0	49.1	44.5	61.8	
26	13:30:15	70.7	66.0	61.7	57.6	59.2	59.8	53.1	50.0	46.1	62.1	
27	13:30:16	73.2	67.8	63.4	58.0	59.0	60.7	54.3	51.2	47.9	62.1	
28	13:30:17	71.0	70.0	63.1	59.5	60.8	61.2	54.2	51.5	48.9	63.3	
29	13:30:18	72.0	70.4	65.1	60.6	61.8	62.8	56.1	52.8	50.2	64.4	
30	13:30:19	75.4	72.4	65.8	60.1	61.3	63.8	56.1	52.9	49.9	64.4	
31	13:30:20	73.8	69.7	65.6	60.3	62.2	63.8	56.1	52.9	49.8	65.8	
32	13:30:21	74.0	72.9	65.4	61.6	61.7	63.1	56.2	52.8	49.6	66.3	
33	13:30:22	72.0	72.9	66.4	62.2	61.8	63.8	56.8	54.1	50.6	66.4	
34	13:30:23	71.7	73.4	66.8	62.2	61.7	63.1	56.2	54.1	50.7	66.0	
35	13:30:24	72.6	75.2	68.1	63.6	62.8	62.3	56.0	55.2	51.4	67.0	
36	13:30:25	73.0	71.2	66.6	62.1	62.6	62.3	56.3	55.0	51.6	66.2	
37	13:30:26	74.5	70.1	64.6	61.1	62.0	62.6	56.8	54.9	50.6	65.7	
38	13:30:27	73.4	69.3	64.7	60.5	61.3	62.4	55.8	54.0	49.3	65.7	
39	13:30:28	71.7	70.1	64.9	60.9	61.3	62.9	55.8	53.5	48.6	65.8	
40	13:30:29	73.0	67.3	64.0	60.9	61.1	62.8	56.0	52.8	47.7	65.4	
41	13:30:30	70.5	68.3	64.5	61.1	61.1	64.3	55.6	52.5	46.9	65.6	
42	13:30:31	70.9	66.9	65.3	60.9	61.4	64.6	56.4	52.2	48.0	65.6	

Niveau 2 : Calculs

1 onglet d'entrée commun

3 fichiers de calculs :

- calculs des indicateurs et de leurs distributions
(1s, 4s, 16s, 64s, 5mn, 16 mn = 960s)
- calculs des fractiles
(960s)
- calculs des nombres de dépassements d'un seuil
(960s)

Niveau 2 : Calculs

Pour chaque fichier de calcul :

- 1 onglet d'entrée
- des onglets de calculs ou analyse
- des onglets de résultats (ou visualisation)
- des onglets de sortie pour affichage ou analyses ultérieures

Niveau 2 : les indicateurs calculés

Calculs itératifs (de 1s à 960s)

Variabilité : moyenne et écart-type

Energétiques :

- LAeq, Lceq, LC – LA
- Leq(31-250Hz), Leq (2-8 kHz)

Spectraux :

- fréquence barycentre spectral
- moment d'inertie spectral
- moment d'inertie spectral normalisé

Niveau 2 : les indicateurs calculés

Calculs sur 960s :

Fractiles :

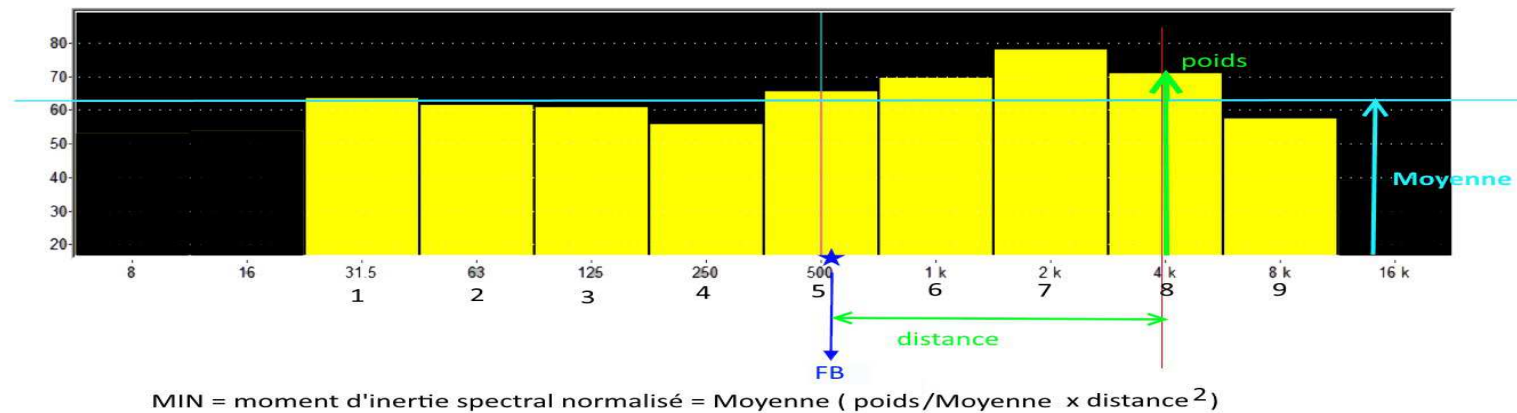
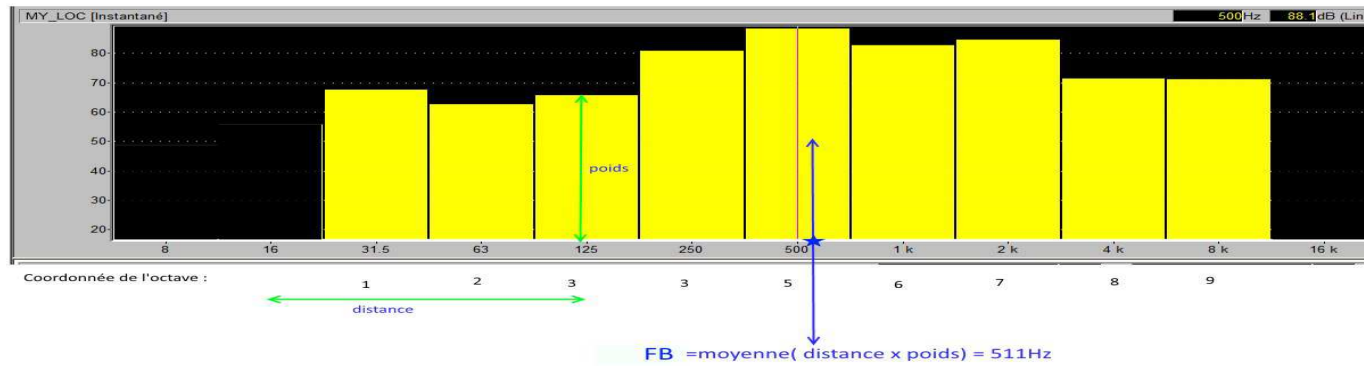
LA10, LAeq, LA50, LA90, LA95

Indices Harmonica

Nombres de dépassements :

- Seuil absolu de 46 à 70dBA par pas de 4 dB
- Seuil décalé de -3 dB à + 6dB par rapport
à une moyenne sur 15s/40s du LAeq
- Seuil décalé de -3 dB à + 6dB par rapport
à une moyenne sur 15s/40s du LA50

Niveau 2 : indicateurs spectraux



Niveau 2 : indicateurs de dépassements



Niveau 2 : les indicateurs calculés

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1																					
2	114646_000000.CMG																				
3	LD-RBA-12-08-22-30																				
4																					
5																					
6																					
7	pondA	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1											
8	pondC	-3.0	-0.8	-0.2	0.0	0.0	0.0	-0.2	-0.8	-3.0											
9		1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0											
10	but péri	31.5	63.0	125.0	250.0	500.0	1k	2k	4k	8k	Laeq-rec	Laeq-mes	delta	LCeq	L-Lin(31-250)	L-Lin-(2k-8k)	fbary	minlin	sum	cbary	I2
11	22.30.01	73.2	71.6	65.0	63.3	64.3	63.6	57.0	54.1	46.7	67.0	67.0	0.002	75.2	75.9	59.1	422.1	46.7	558.8	4.7	15.8
12	22.30.02	75.9	76.6	66.7	64.1	66.7	65.1	58.1	55.4	48.6	68.7	68.7	0.006	78.7	79.5	60.3	418.1	48.6	577.2	4.7	15.5
13	22.30.03	76.7	79.5	67.1	64.5	66.7	66.5	59.3	56.6	49.0	69.6	69.6	-0.037	80.6	81.5	61.4	417.6	49.0	585.9	4.7	16.1
14	22.30.04	73.0	80.7	65.5	64.6	65.9	65.8	59.7	56.8	48.6	69.2	69.2	-0.002	80.9	81.5	61.7	422.6	48.6	580.6	4.7	15.8
15	22.30.05	69.7	77.5	66.5	64.3	63.6	66.4	59.6	55.2	46.5	68.9	68.8	-0.083	78.2	78.5	61.1	424.7	46.5	569.3	4.7	16.6
16	22.30.06	69.9	68.3	65.1	63.1	61.7	65.1	57.0	52.2	42.4	67.2	67.0	-0.165	73.2	73.0	58.4	420.8	42.4	544.8	4.7	19.3
17	22.30.07	68.5	68.1	66.2	62.1	60.5	63.0	55.2	49.1	39.7	65.3	65.3	-0.041	72.6	72.5	56.3	409.2	39.7	532.4	4.6	21.4
18	22.30.08	70.2	67.7	64.0	62.2	59.1	62.2	53.5	46.7	37.4	64.3	64.1	-0.234	72.3	72.8	54.4	397.1	37.4	523.0	4.6	24.1
19	22.30.09	66.7	65.5	62.8	58.9	57.3	59.8	51.5	44.1	35.1	62.0	61.9	-0.131	69.8	70.1	52.3	394.2	35.1	501.7	4.6	25.2
20	22.30.10	67.3	67.0	61.2	58.1	55.7	58.2	50.2	43.3	34.1	60.6	60.5	-0.068	70.0	70.7	51.1	386.0	34.1	495.1	4.5	26.6
21	22.30.11	63.8	68.4	60.1	56.9	54.6	55.6	48.3	41.5	33.1	58.6	58.4	-0.169	69.6	70.1	49.2	381.6	33.1	482.3	4.5	26.9
22	22.30.12	62.5	70.5	57.6	55.9	51.8	54.1	47.9	41.3	33.8	57.2	57.0	-0.198	70.7	71.3	48.9	382.4	33.8	475.4	4.5	25.2

I2	ntrib de chaque octave	lprim2	ntrib de chaque octave au	LC-LA	C-LAEQ	C-Lceq
15.8	# # # # #	11.9	# # # # #	8.2	5009530.3	33350114.7
15.5	# # # # #	11.8	# # # # #	10.0	7402289.1	73409211.3
16.1	# # # # #	12.1	# # # # #	11.0	9198779.2	115666501.4
15.8	# # # # #	12.0	# # # # #	11.7	8322376.3	123014206.5
16.6	# # # # #	12.3	# # # # #	9.3	7732594.9	66232995.2
19.3	# # # # #	13.6	# # # # #	6.1	5205606.3	20993657.9
21.4	# # # # #	14.4	# # # # #	7.2	3420886.0	18027127.8
24.1	# # # # #	15.6	# # # # #	8.0	2712977.0	16932155.0
25.2	# # # # #	15.9	# # # # #	7.8	1596086.0	9541308.1
26.6	# # # # #	16.6	# # # # #	9.4	1139594.1	9916108.0

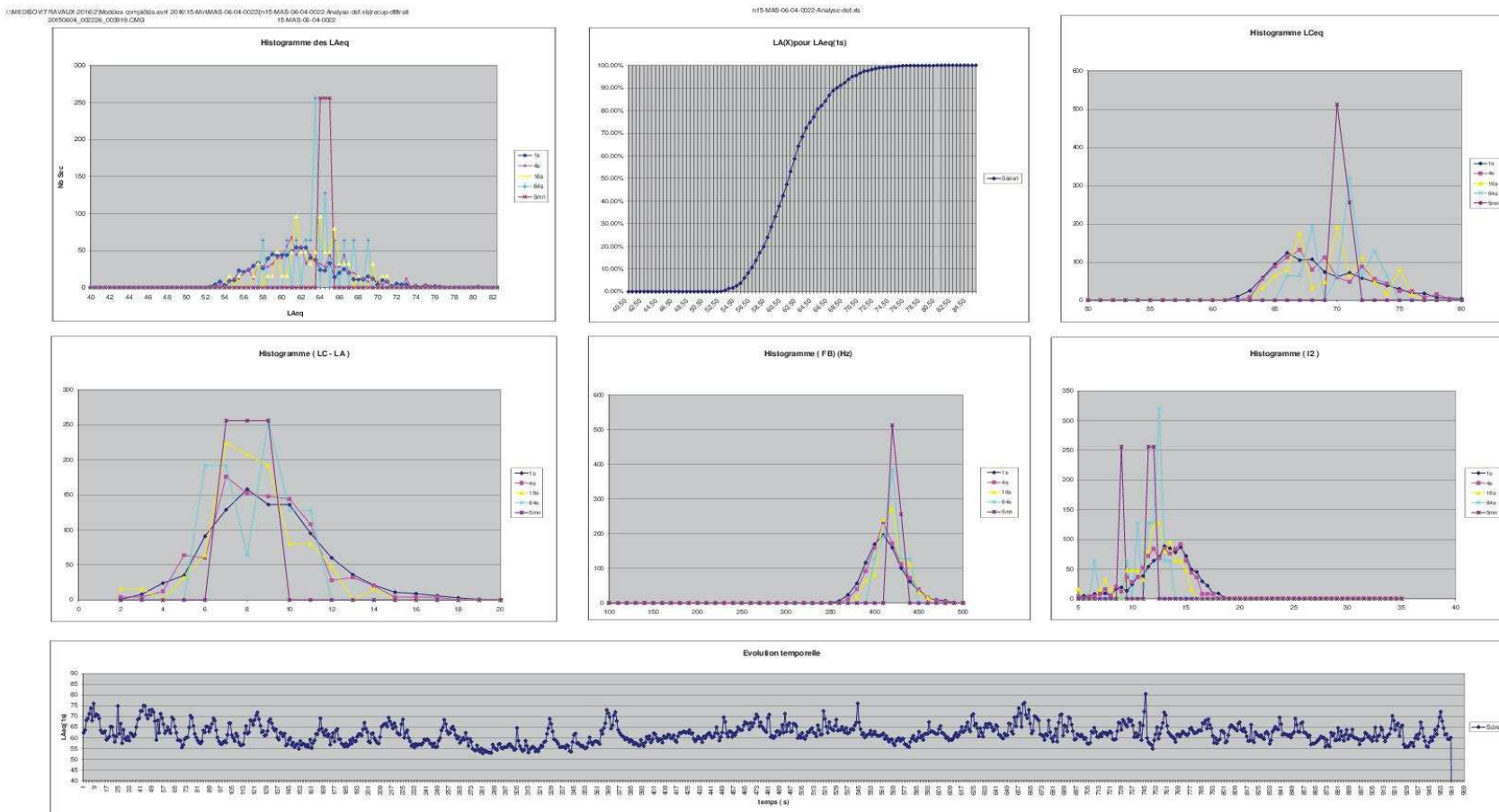
Niveau 2 : Exemple de résultats

Résultat sous forme tableau :

Durée période	L _{Aeq}	L _{Ceq}	L-Lin(31-250)	L-Lin-(2k-8k)	f _{bary}	c _{bary}	I ₂	I _{prim2}	LC-LA
Leq(15 mn)	64.5	71.1							
1s									
moyenne	61.8	69.3	68.5	54.1	416.8	4.7	19.0	13.2	7.5
Ecart type	4.3	3.7	4.2	4.6	21.5	0.1	4.9	2.6	2.6
MIN	52.6	62.3	60.4	44.2	353.5	4.4	3.7	3.2	0.5
MAX	80.5	81.1	81.1	72.5	501.3	5.0	33.1	18.9	18.0
L10	67.8								
L50	61.4								
L90	56.4								
L95	55.4								
L _{Aeq} -L95	9.1								
Harmonica BGN :	5.1								
Harmonica EVT :	2.3								
BGN+EVT :	7.4								
4s									
moyenne	62.4	69.6	68.7	54.7	419.4	4.7	18.2	12.9	7.2
Ecart type	4.1	3.5	4.0	4.4	19.7	0.1	4.4	2.4	2.4
MIN	53.5	63.3	61.3	45.6	370.1	4.5	4.9	4.4	1.1
MAX	75.1	79.1	79.3	67.1	488.4	5.0	28.3	17.9	15.7
16s									
moyenne	63.1	70.0	69.2	55.7	423.2	4.7	17.0	12.3	6.9
Ecart type	3.5	3.1	3.7	3.7	15.6	0.1	3.9	2.2	1.9
MIN	54.7	64.5	62.7	46.7	387.9	4.6	6.1	5.3	1.8
MAX	71.1	77.0	77.5	62.4	463.9	4.9	25.2	16.0	12.7
64s									
moyenne	63.7	70.6	70.0	56.5	424.6	4.7	16.1	11.8	6.8
Ecart type	2.7	2.4	2.7	2.5	11.3	0.0	3.0	1.8	1.7
MIN	58.0	66.1	65.8	51.2	406.3	4.6	7.7	6.6	1.9
MAX	68.8	74.1	74.4	60.8	447.8	4.8	19.6	13.6	9.8
5 mn									
moyenne	64.5	71.0	70.6	56.8	426.2	4.7	15.7	11.7	5.9
Ecart type	0.6	0.5	0.5	0.5	4.8	0.0	2.7	1.1	0.6
MIN	63.8	70.7	70.4	56.8	421.3	4.7	11.7	9.4	5.9
MAX	65.0	71.6	71.3	57.6	431.0	4.7	16.9	12.3	7.1

Niveau 2 : Exemple de résultats

Histogrammes :



Niveau 2 : Exemple de résultats

Autres sorties :

LD-MAS-11-04-2315							
	moyenne	<i>Ecart-type</i>					
L _{Aeq} (1s)	63.7	2.8					
L _{Aeq} (4s)	52.4	4.4					
L _{Aeq} (16s)	52.5	4.5					
L _{Aeq} (64s)	52.9	4.7					
					moy	ET	
L _{A50} (15s)	63.7	2.0		L _{A50} (15s) - L _{A50} (120s)	0.09	1.98	
L _{A50} (40s)	63.6	1.6		L _{A50} (40s) - L _{A50} (120s)	0.04	1.47	
L _{A50} (80s)	63.6	1.4		L _{A50} (80s) - L _{A50} (120s)	-0.02	0.87	
L _{A50} (120s)	63.6	1.4					
L _{A10} (15mn)	67.3						
L _{A50} (15mn)	63.4						
L _{A90} (15mn)	60.6						
L _{A95} (15mn)	59.8						
L _{aeq1s} (15mn)	64.9						

Niveau 2 : Exemple de résultats

Autres sorties :

LD-MAS-11-04-2315									
L _{Aeq}	Hyst :	2							
décalage/MG-L _{Aeq}		3	2	1	0	-1	-2	-3	-6
MG(15s)	%age temps	59%	39%	22%	11%	5%	2%	1%	0%
MG(15s)	Nb events	38	61	67	60	36	16	12	1
MG(40s)	%age temps	50%	34%	21%	12%	7%	3%	2%	1%
MG(40s)	Nb events	43	60	65	46	33	19	13	7
L ₅₀	Hyst :	2							
décalage/MG-L ₅₀	0	3	2	1	0	-1	-2	-3	-6
MG(15s)	%age temps	72%	50%	33%	18%	9%	5%	3%	1%
MG(15s)	Nb events	21	53	71	70	49	33	19	10
MG(40s)	%age temps	67%	50%	35%	20%	13%	7%	4%	1%
MG(40s)	Nb events	21	48	65	54	45	33	21	9
Seuil Abs :	Hyst :	0							
niveau	(dB)	46	50	54	58	62	66	70	74
MG(15s)	%age temps	99%	99%	99%	99%	71%	17%	3%	0%
		0	0	0	1	100	62	17	4
Temps MoySil		960	960	960	10	3	13	55	239

Niveau 3 : Affichages et Analyses

Données d'entrée = sorties niveau 2

Format adapté à l'indicateur à analyser

Jusque 24 situations (Site x Horaires)
(>>>> calcul Lden)

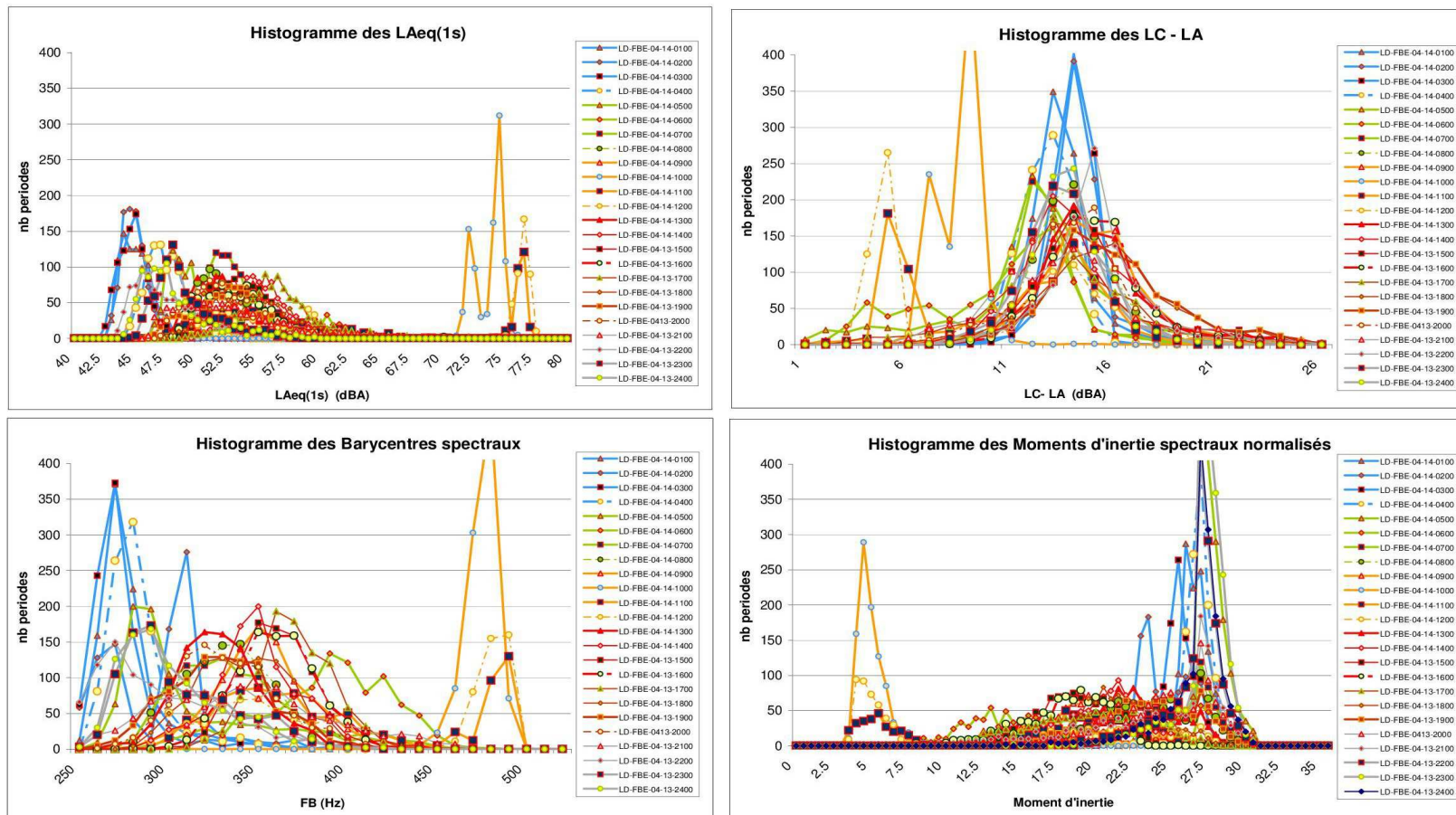
Niveau 3 : Affichages et Analyses

Exemple tableau sur 24h pour 1 site :

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	L _{Aeq} L	L _{Aeq} S	L _{Aeq} N	L _{DEN}																				
	69.1	65.9	61.1	67.2																				
	LD-RBA-12-09-01-30	LD-RBA-12-09-02-30	LD-RBA-12-09-03-30	LD-RBA-12-09-04-30	LD-RBA-12-09-05-30	LD-RBA-12-09-06-30	LD-RBA-12-09-07-30	LD-RBA-12-09-08-30	LD-RBA-12-09-09-30	LD-RBA-12-09-10-30	LD-RBA-12-09-11-30	LD-RBA-12-09-12-30	LD-RBA-12-09-13-30	LD-RBA-12-09-14-30	LD-RBA-12-09-15-30	LD-RBA-12-09-16-30	LD-RBA-12-09-17-30	LD-RBA-12-09-18-30	LD-RBA-12-09-19-30	LD-RBA-12-09-20-30	LD-RBA-12-09-21-30	LD-RBA-12-09-22-30	LD-RBA-12-09-23-30	LD-RBA-12-09-00-30
L _{Aeq} (15mn)	57.7	50.6	48.5	62.3	55.7	61.6	67.7	71.5	67.7	67.2	70.0	68.5	66.9	66.8	66.7	74.4	67.8	66.5	67.6	65.5	62.6	64.7	64.6	62.1
L10	53.3	41.0	40.7	57.8	41.6	65.8	72.8	74.9	72.3	70.9	71.8	71.4	70.8	70.9	70.4	71.8	71.9	70.3	71.4	70.0	66.4	69.4	69.3	66.5
L50	43.3	40.0	40.0	41.0	40.4	42.4	57.8	69.5	62.4	64.4	64.4	65.9	63.9	63.8	64.9	65.4	64.3	64.3	65.5	60.3	53.9	53.8	53.4	47.8
L90	40.0	39.8	39.8	39.9	39.8	40.4	45.3	58.3	50.8	56.3	55.8	55.9	55.9	54.3	54.3	52.9	52.5	55.9	55.5	50.3	49.8	44.9	45.3	41.4
L95	39.8	39.3	39.3	39.8	39.8	40.3	43.9	55.3	48.3	53.8	52.9	53.9	54.8	52.4	52.8	50.8	50.8	54.3	53.3	48.4	48.3	43.9	43.9	40.8
L _{Aeq} -L95	17.8	11.3	9.2	22.5	15.9	21.3	23.7	16.2	19.4	13.4	17.0	14.5	12.1	14.4	13.9	23.6	17.0	12.2	14.4	17.1	14.3	20.8	20.7	21.3
Harmonica BGN :	2.0	1.9	1.9	2.0	2.0	2.1	2.8	5.1	3.7	4.8	4.6	4.8	5.0	4.5	4.6	4.2	4.2	4.9	4.7	3.7	3.7	2.8	2.8	2.2
Harmonica EVT :	4.5	2.8	2.3	5.6	4.0	5.3	5.9	4.0	4.8	3.4	4.3	3.6	3.0	3.6	3.5	5.9	4.2	3.0	3.6	4.3	3.6	5.2	5.2	5.3
BGN-EVT :	6.4	4.7	4.2	7.6	5.9	7.4	8.7	9.1	8.5	8.1	8.8	8.4	8.0	8.1	8.0	10.1	8.4	7.9	8.2	7.9	7.2	8.0	8.0	7.5
LC _{eq} (15mn)	67.5	58.2	59.2	70.7	61.7	71.8	75.3	79.3	77.7	76.9	79.0	78.1	76.6	76.2	76.6	78.6	76.8	76.3	77.2	74.8	70.6	72.7	71.6	68.6
Moy (LC-LA)(1s)	12.7	13.2	13.7	12.0	13.5	13.0	10.4	8.5	10.6	10.6	11.4	10.4	10.2	10.7	10.1	10.6	10.0	10.7	9.7	10.4	9.1	10.5	9.7	10.2
ET (LC-LA)(1s)	2.5	1.8	1.5	3.3	1.7	2.8	3.8	2.4	3.3	2.7	3.4	3.2	3.0	3.4	3.1	3.8	2.9	2.8	2.6	2.8	2.9	3.1	3.0	2.9
Moy (F Baryc.)	344.2	325.3	319.5	340.3	316.5	332.6	379.8	410.7	395.1	404.7	404.7	412.7	418.0	411.0	412.7	410.1	409.2	408.8	407.2	395.1	394.3	376.1	382.8	363.4
ET (F Baryc.)	30.4	19.3	14.4	42.8	14.3	35.4	42.4	22.0	29.0	22.0	20.3	22.5	19.9	25.3	24.6	27.6	22.4	19.7	20.7	25.4	27.7	36.5	33.9	37.5
Moy (Momt Inertie I2)	21.3	22.3	23.0	21.3	23.1	21.8	18.0	14.8	15.6	14.4	14.3	12.2	11.5	12.4	12.3	12.6	13.0	12.7	13.3	15.1	15.2	17.7	16.9	19.5
ET (Momt Inertie I2)	3.5	2.3	1.2	4.3	1.1	3.4	4.3	2.7	3.0	2.5	2.7	2.2	2.0	2.5	2.4	2.5	2.2	2.0	2.4	2.6	2.9	3.8	3.7	3.9
moy (L _{Aeq} (1s)	45.8	40.9	40.9	45.9	41.2	46.2	58.6	68.2	61.9	64.2	64.5	64.9	63.7	63.2	63.7	64.3	63.3	63.9	64.7	60.1	56.0	55.7	55.3	49.8
ET (L _{Aeq} (1s)	6.7	3.6	3.5	8.5	3.8	8.6	10.2	6.3	8.1	5.5	6.1	5.9	5.7	6.2	5.9	7.8	7.2	5.3	5.9	7.4	6.5	9.0	8.7	8.9
moy (L _{Aeq} (16s)	46.9	41.2	41.0	47.3	41.4	48.0	61.9	70.4	64.5	65.6	66.6	66.2	64.9	64.8	65.1	65.8	65.1	65.2	65.7	61.7	57.8	58.5	57.9	52.3
ET (L _{Aeq} (16s)	7.3	4.3	3.9	9.7	4.6	9.6	9.5	3.6	6.4	4.3	5.0	5.0	4.6	4.8	4.5	7.2	6.1	3.7	5.0	6.8	6.6	8.8	8.6	9.9
moy (L _{Aeq} (64s)	48.6	41.8	41.7	52.2	42.9	53.9	65.6	71.3	66.9	66.8	68.0	68.0	66.6	66.4	66.5	68.3	67.4	66.2	67.3	64.6	61.0	63.2	62.7	57.6
ET (L _{Aeq} (64s)	8.0	5.6	5.0	11.2	7.1	10.6	6.4	1.6	2.9	1.9	3.6	2.2	1.8	2.2	1.3	5.2	1.9	1.8	1.9	3.3	4.0	4.8	5.7	8.5
	585418.942	115299.253	70950.6497	1693724.32	373080.849	1451495.88	5845477.53	14215870.6	5839091.36	5243591.99	9927896.59	7005254.98	4900079.6	4752496.42	4685130.87	27637094.2	5991454.57	4452297.26	5803973.38	3522717.01	1839618.77	2937461.87	2878528.6	1620407.51

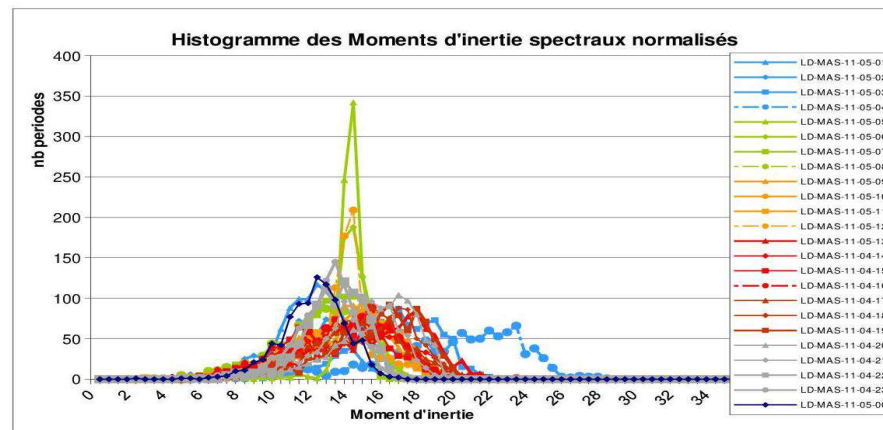
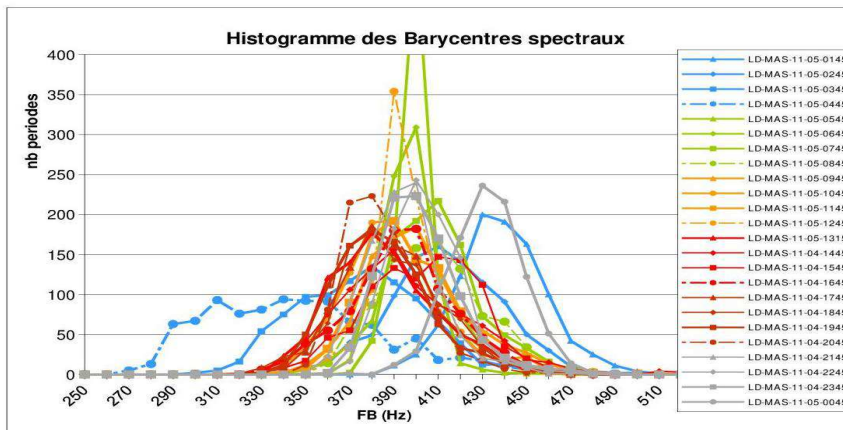
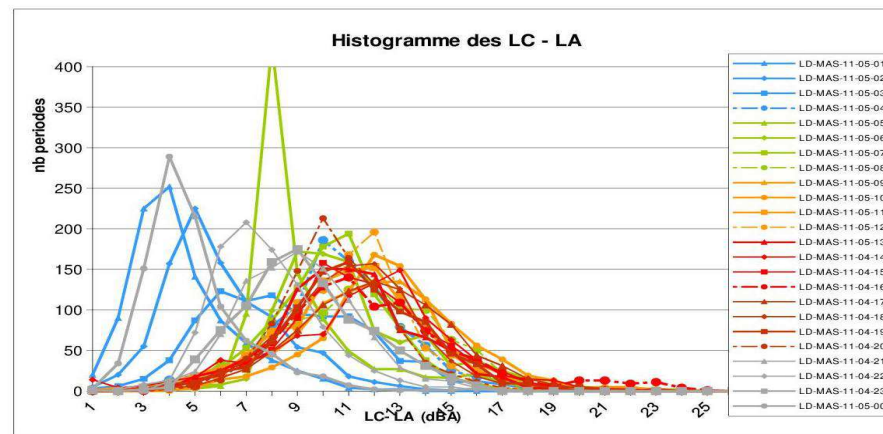
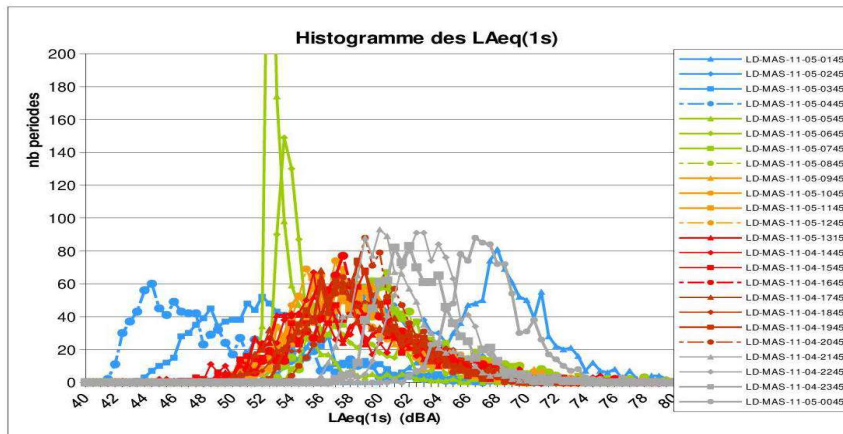
Niveau 3 : Affichages et Analyses

Exemple : Histogrammes sur 24h pour 1 site : FBE



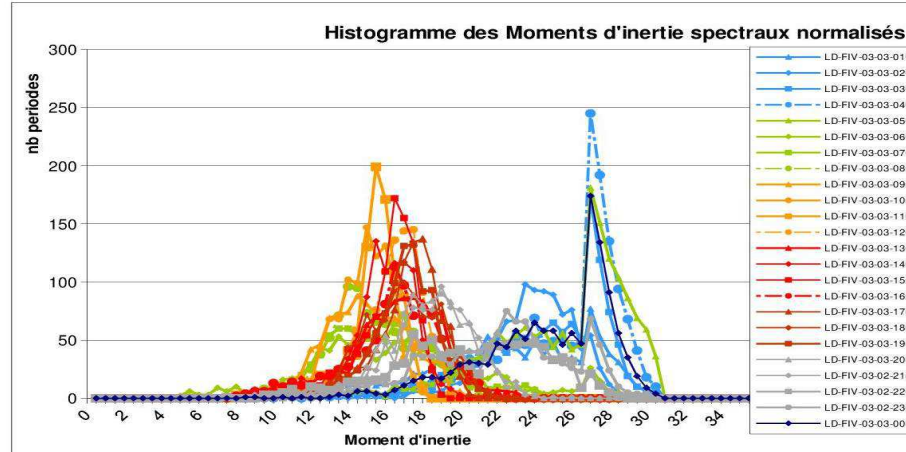
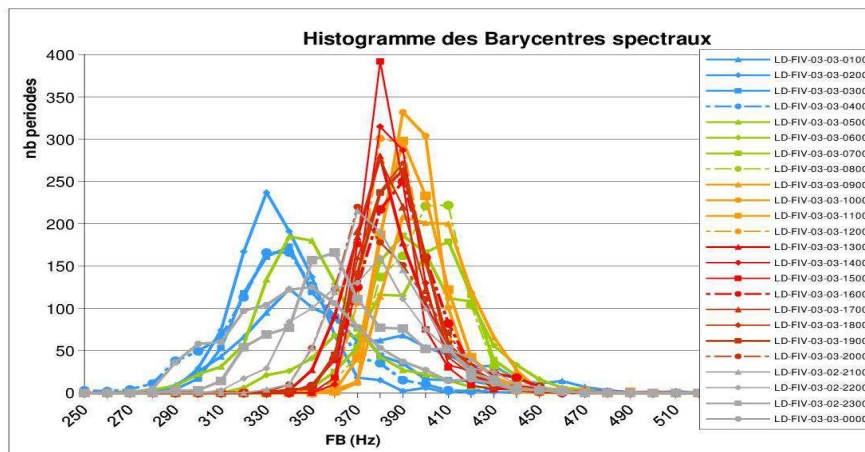
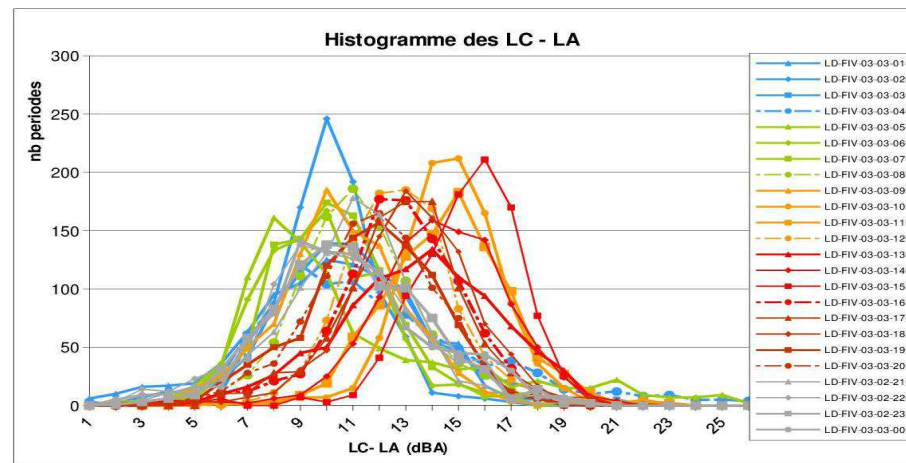
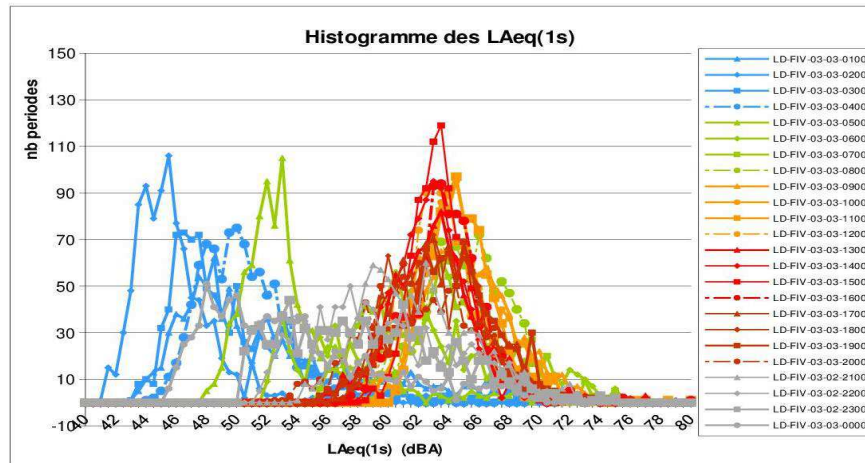
Niveau 3 : Affichages et Analyses

Exemple : Exemple d'histogrammes : MAS



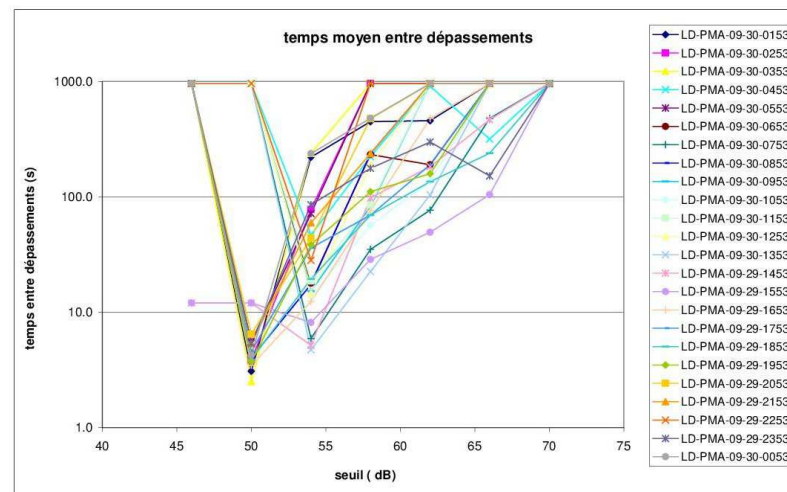
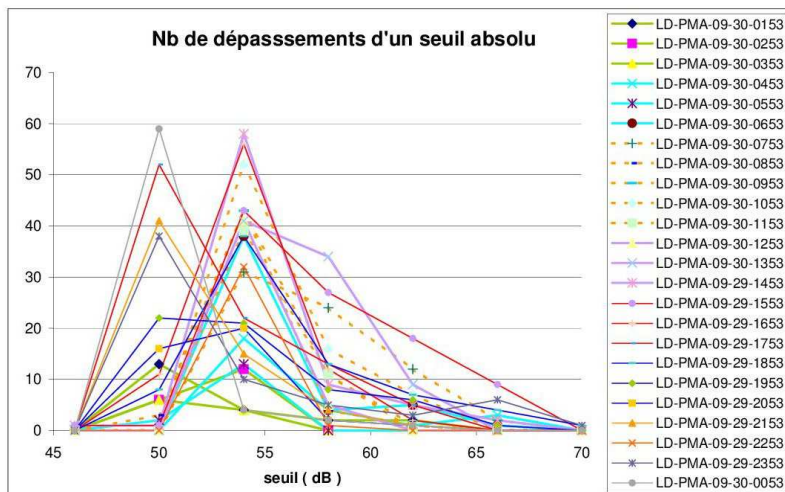
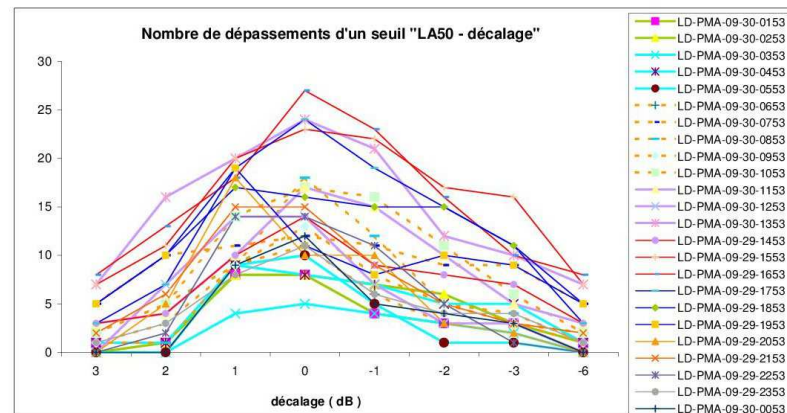
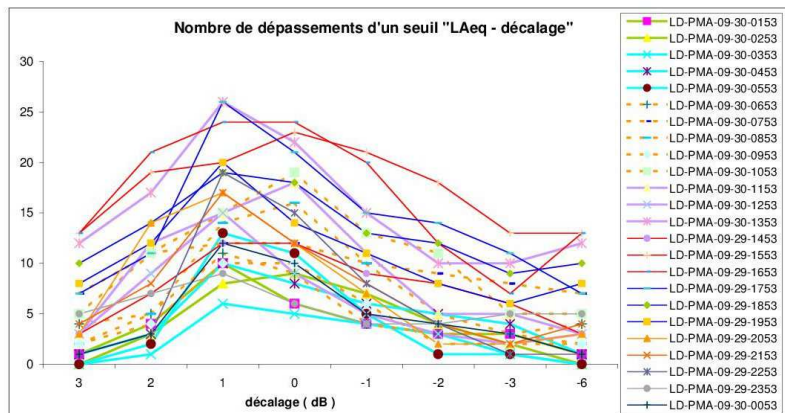
Niveau 3 : Affichages et Analyses

Exemple : Histogrammes pour le site FIV



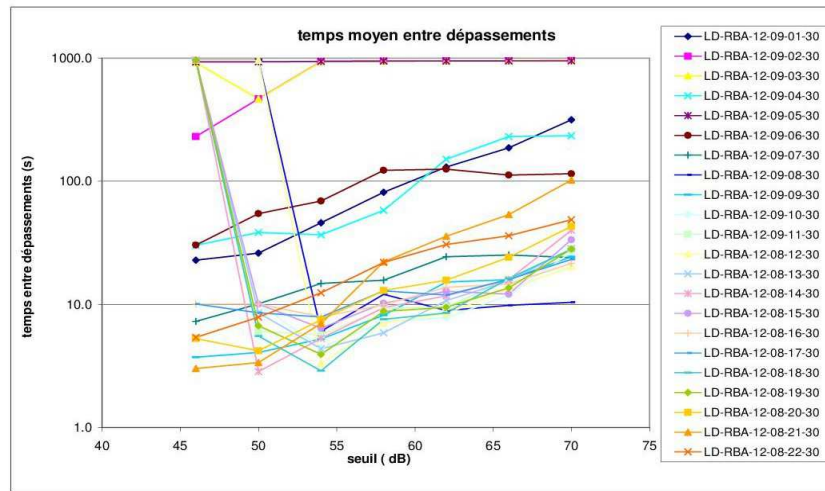
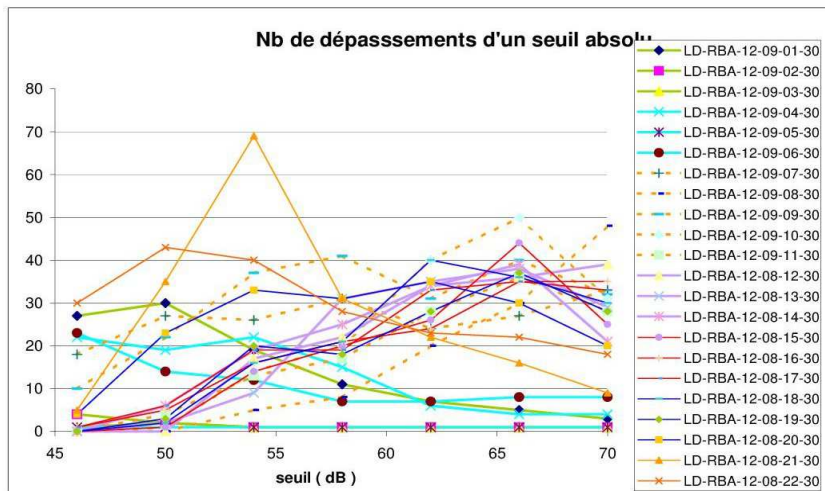
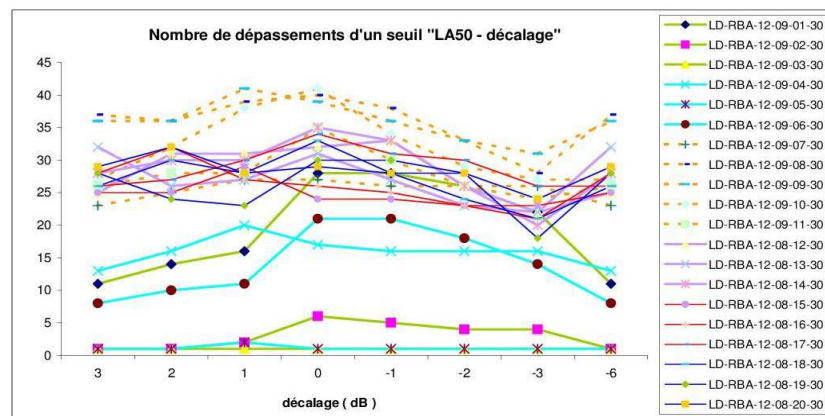
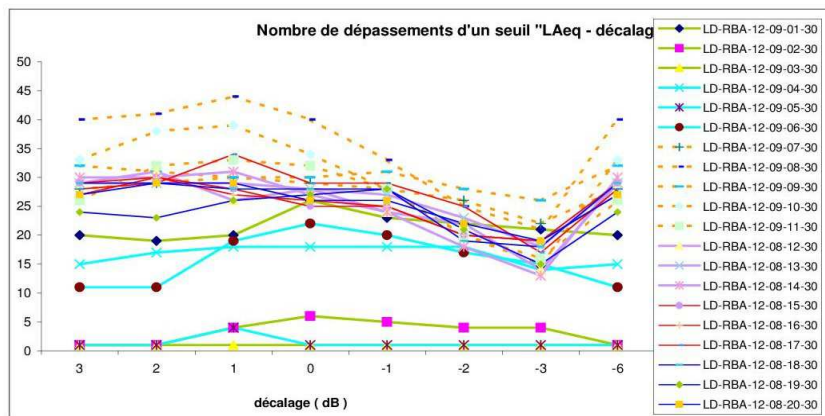
Niveau 3 : Affichages et Analyses

Exemple : Variation du Nombre de Dépassements pour 1 site : PMA



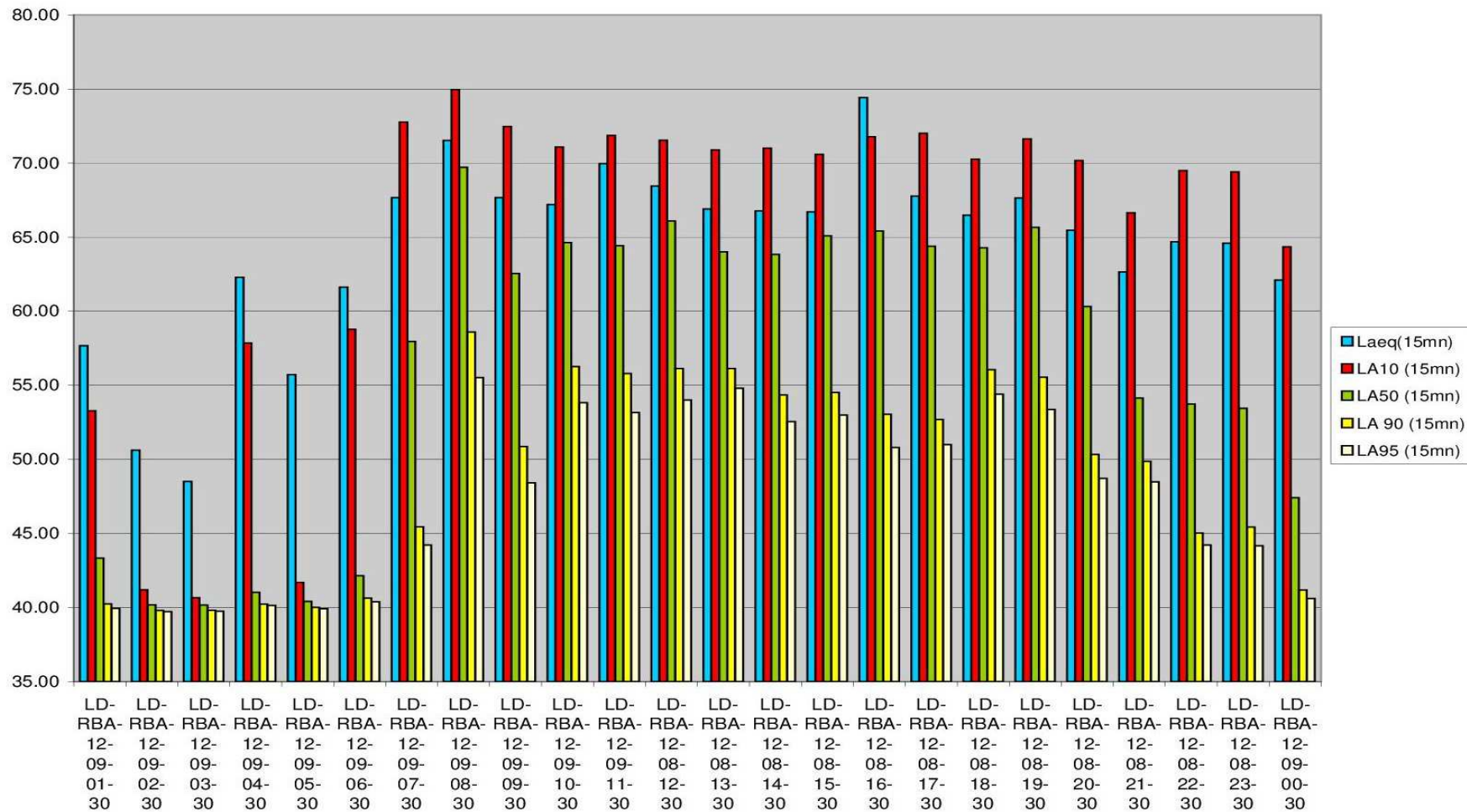
Niveau 3 : Affichages et Analyses

Exemple : Variation du Nombre de Dépassements pour 1 site : RBA



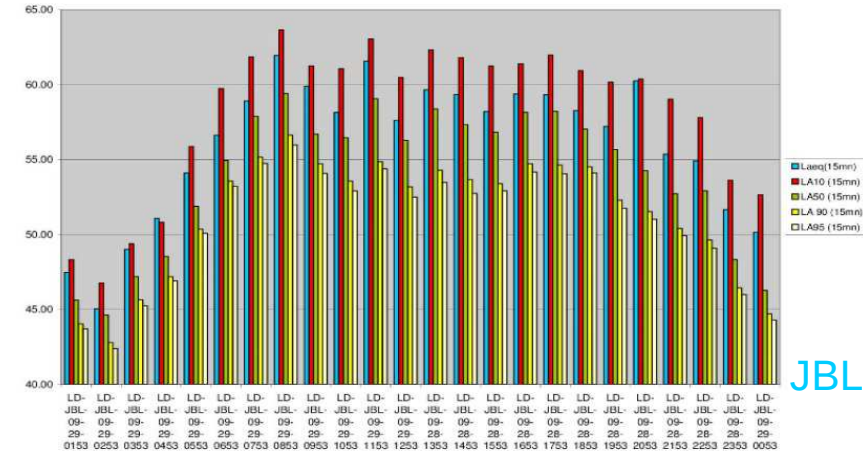
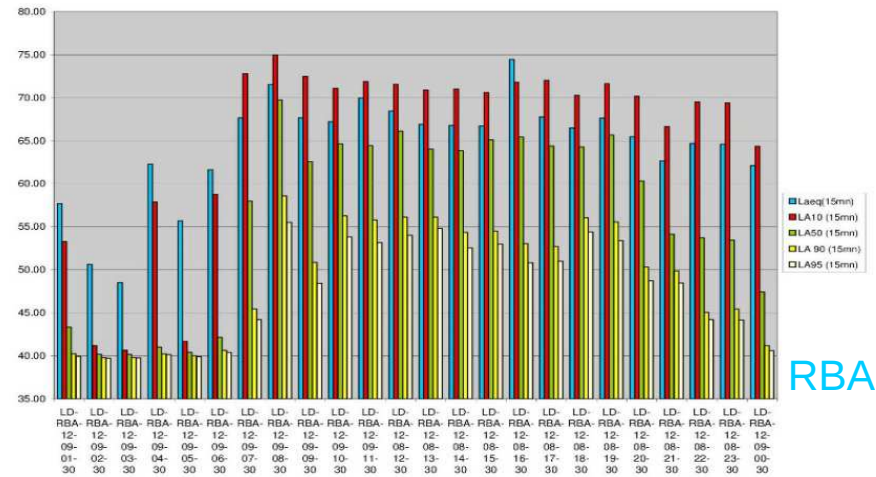
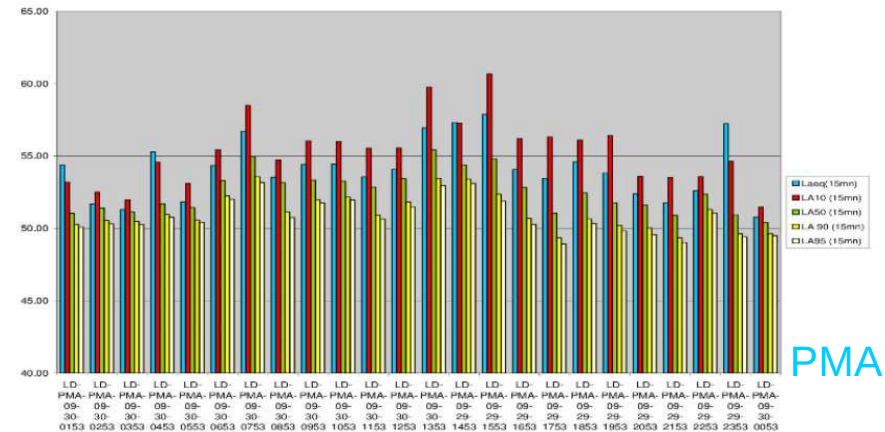
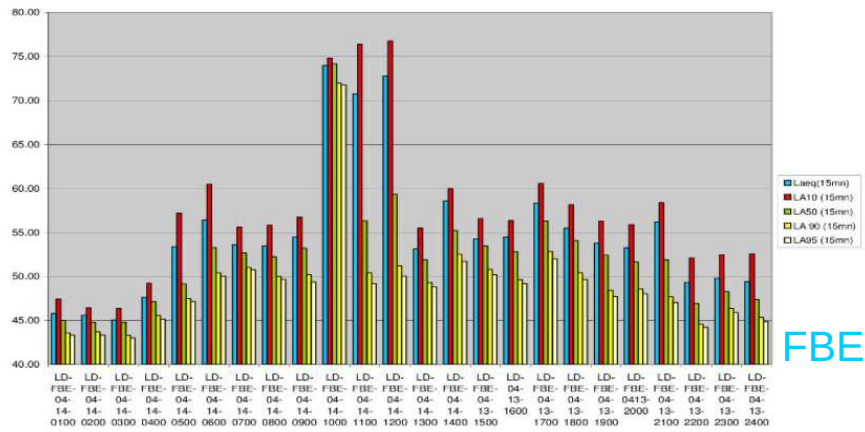
Niveau 3 : Affichages et Analyses

Exemple : Représentation des fractiles pour 1 site :

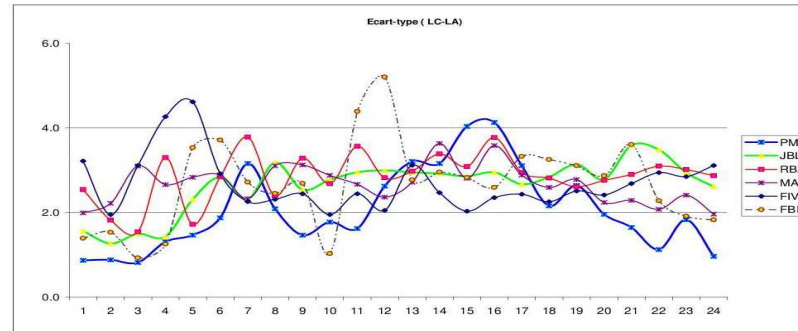
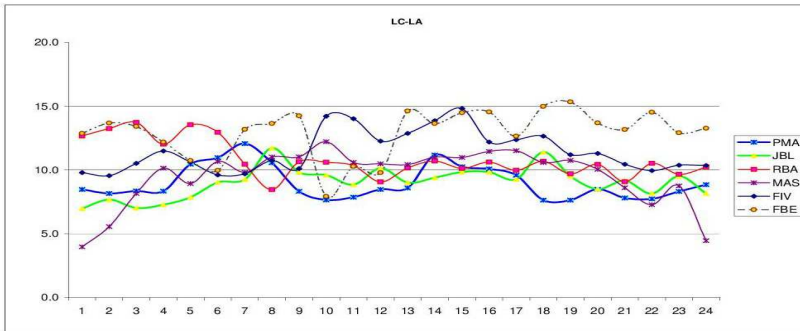
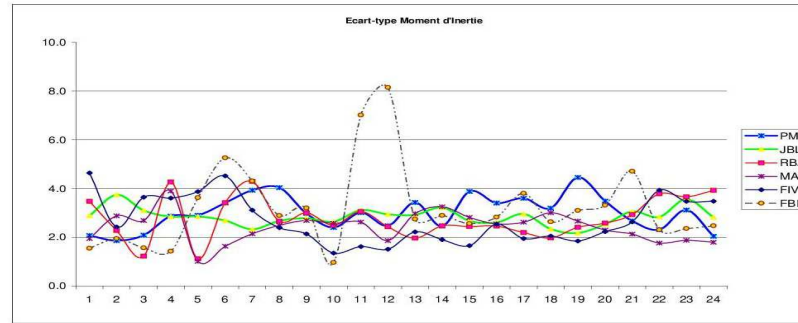
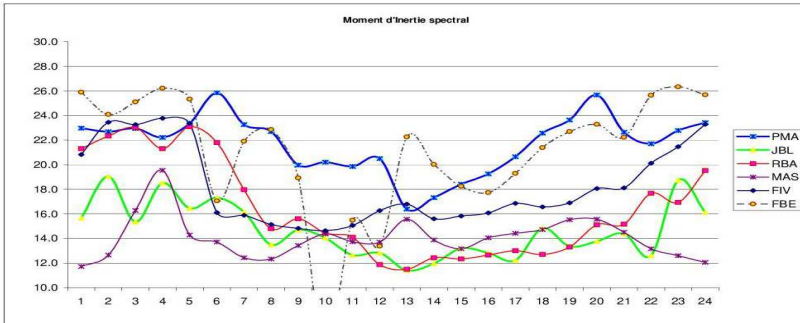
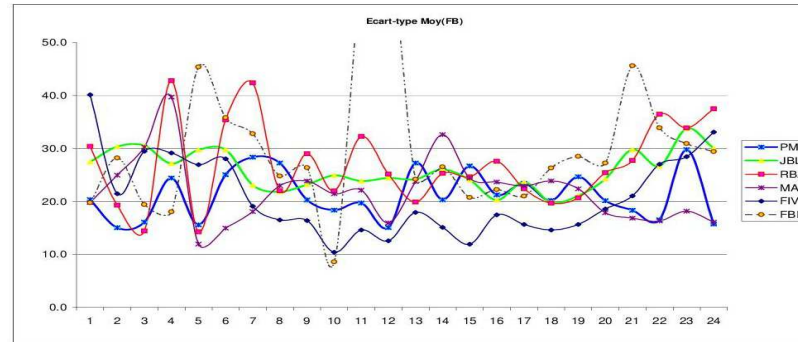
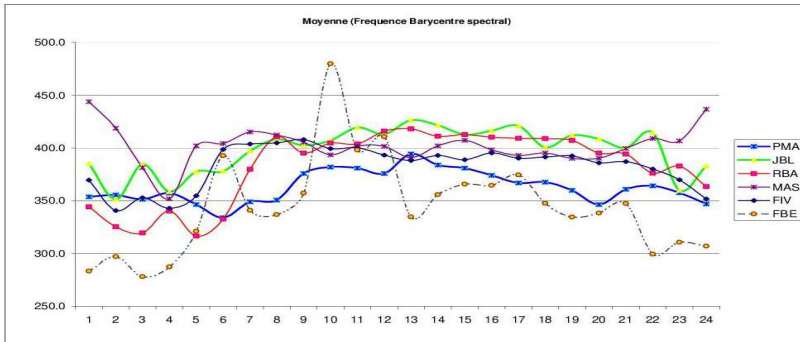


Niveau 3 : Affichages et Analyses

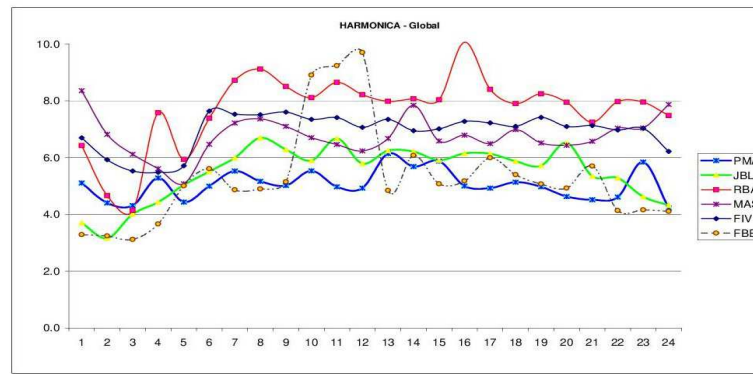
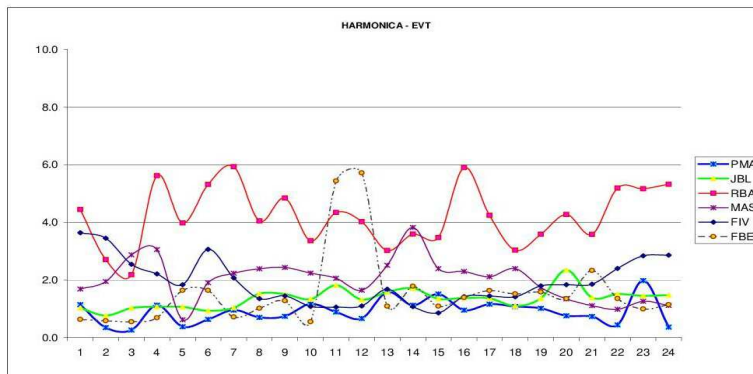
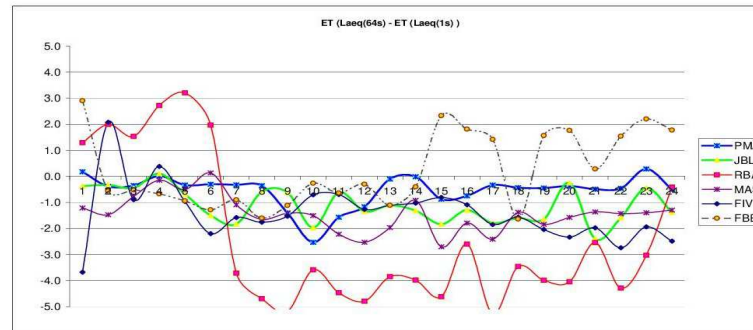
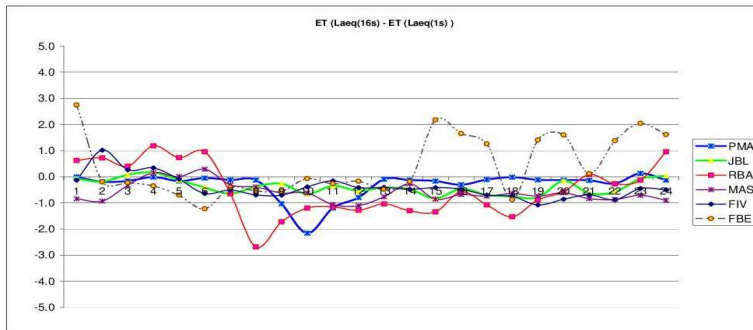
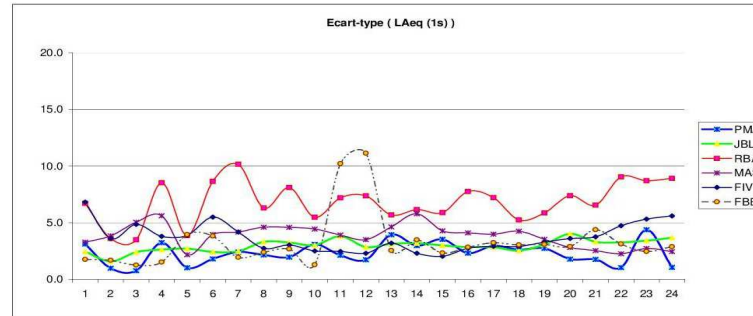
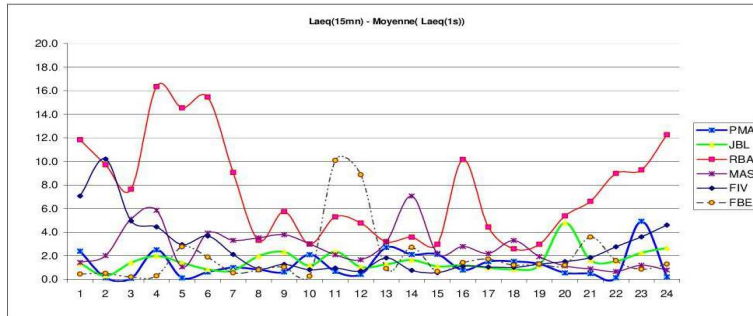
Exemple : Comparaison des fractiles



Niveau 4 : Analyse - Spectral



Niveau 4 : Analyse - Variabilité



Ce qui n'a pas (encore) été fait :

Etude des corrélations entre indicateurs

Etude de l'influence d'un traitement partiel ($\frac{1}{4}$ du temps)

Tâche suivante : corrélation avec enquêtes

Ce qui n'a pas (encore) été fait :

Etude des corrélations entre indicateurs

Etude de l'influence d'un traitement partiel ($\frac{1}{4}$ du temps)

Tâche suivante : corrélation avec enquêtes

Ce qui a progressé :

Discrimination des sources de bruit

Reconnaissance des typologies d'ambiances :

- "bruit dans la boîte"
- bruit proche
- bruit intégré (temps et espace)

Reconnaissance de sources
(parole, oiseaux, pas, routier)

Merci de votre attention

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Ont participé à l'étude :
David ATTALI, Louise MAZOUZ, Benoît CREPIN
CEREMA /DterNP/AB

