

**Comportement de l'onde d'une, de deux puis de trois cordes de piano**  
par tranche de 0,02s sur 3s

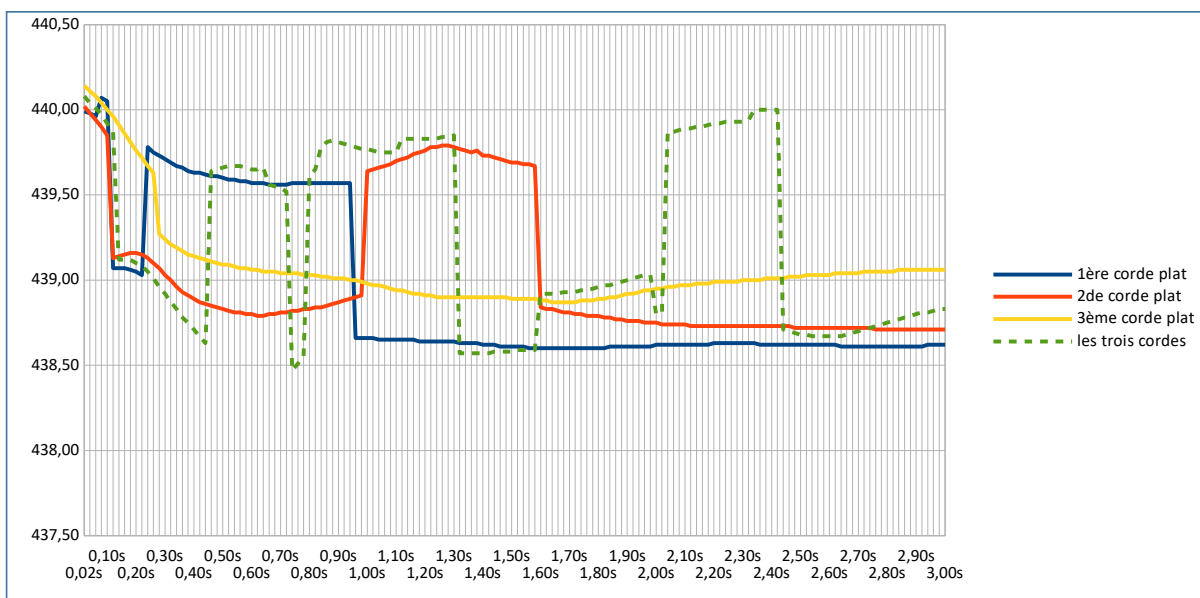
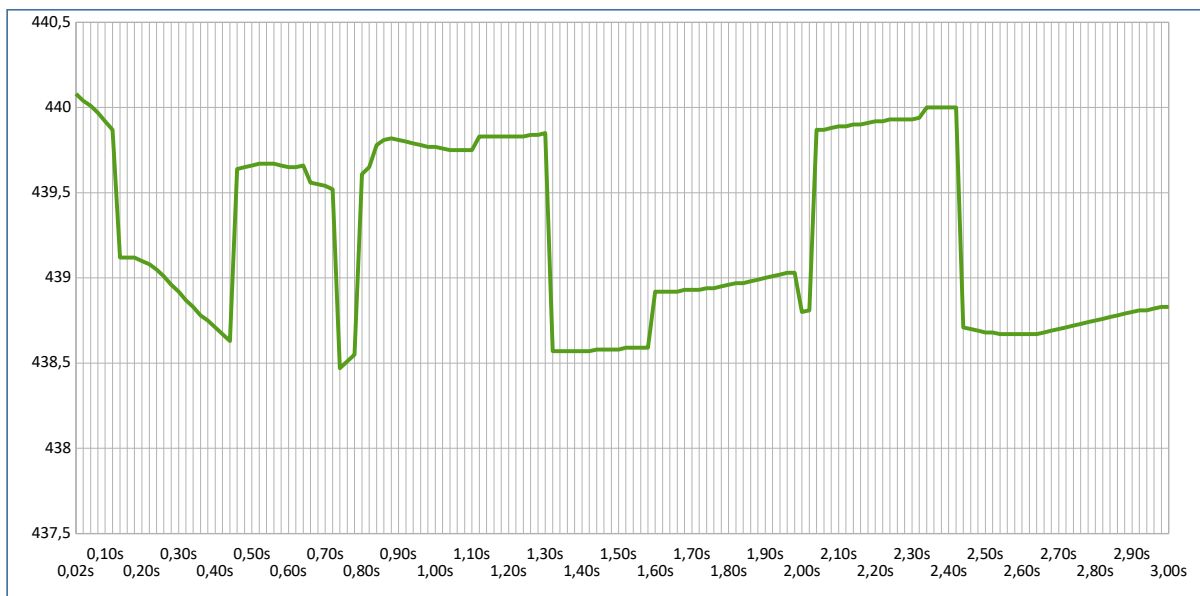
	1ère corde plat	2de corde plat	3ème corde plat	1er+2de cordes	2de+3ème cordes	1er+3ème cordes	les trois cordes
	fréq. globale	fréq. globale	fréq. globale	fréq. globale	fréq. globale	fréq. globale	fréq. globale
	A4=438,61Hz	A4=439,69Hz	A4=438,89Hz	A4=438,70Hz	A4=439,00Hz	A4=439,01Hz	A4=438,58Hz
0,02s	439,99	440,02	440,14	440,06	440,11	440,14	440,08
	439,98	439,98	440,11	440,02	440,08	440,12	440,04
	439,96	439,94	440,08	439,98	440,04	440,06	440,01
	440,07	439,90	440,04	439,94	440,00	440,02	439,97
0,10s	440,05	439,85	440,00	439,89	439,96	439,96	439,92
	439,07	439,13	439,96	439,14	439,91	439,91	439,87
	439,07	439,14	439,91	439,14	439,86	439,85	439,12
	439,07	439,15	439,86	439,13	439,80	439,79	439,12
	439,06	439,16	439,81	439,12	439,74	439,73	439,12
0,20s	439,05	439,16	439,76	439,10	439,23	439,67	439,10
	439,03	439,15	439,72	439,07	439,20	439,63	439,08
	439,78	439,13	439,67	439,03	439,17	439,60	439,05
	439,75	439,10	439,63	438,99	439,14	439,27	439,01
	439,73	439,07	439,27	438,94	439,10	439,25	438,96
0,30s	439,71	439,03	439,24	438,89	439,06	439,23	438,92
	439,69	439,00	439,21	438,85	439,02	439,22	438,87
	439,67	438,96	439,19	438,81	438,99	439,21	438,83
	439,66	438,93	439,17	438,77	438,96	439,21	438,78
	439,64	438,91	439,15	438,74	438,94	439,21	438,75
0,40s	439,63	438,89	439,14	438,71	438,92	439,21	438,71
	439,63	438,87	439,13	438,68	438,91	439,21	438,67
	439,62	438,86	439,12	438,66	438,90	439,21	438,63
	439,61	438,85	439,11	438,64	438,89	439,20	439,64
	439,61	438,84	439,10	438,62	438,88	439,20	439,65
0,50s	439,60	438,83	439,09	438,61	438,88	439,19	439,66
	439,59	438,82	439,09	438,59	438,87	439,18	439,67
	439,59	438,81	439,08	438,57	439,94	439,18	439,67
	439,58	438,81	439,07	438,55	439,95	439,18	439,67
	439,58	438,80	439,07	438,53	439,96	439,17	439,66
0,60s	439,57	438,80	439,06	438,52	440,04	439,17	439,65
	439,57	438,79	439,06	438,50	440,05	439,16	439,65
	439,57	438,79	439,05	439,47	440,07	439,16	439,66
	439,56	438,80	439,05	439,47	440,08	439,16	439,56
	439,56	438,80	439,05	439,47	440,10	439,15	439,55
0,70s	439,56	438,81	439,04	439,46	440,12	439,15	439,54
	439,56	438,81	439,04	439,46	440,14	439,15	439,52
	439,57	438,82	439,04	439,50	439,07	439,14	438,47
	439,57	438,82	439,04	439,49	440,17	439,14	438,51
	439,57	438,83	439,03	439,49	440,16	439,14	438,55
0,80s	439,57	438,83	439,03	439,48	440,14	439,14	439,61
	439,57	438,84	439,03	439,47	440,12	439,13	439,65
	439,57	438,84	439,02	439,46	440,10	439,13	439,78
	439,57	438,85	439,02	439,46	440,08	439,12	439,81
	439,57	438,86	439,01	439,46	440,00	439,12	439,82
0,90s	439,57	438,87	439,01	439,46	439,99	439,12	439,81
	439,57	438,88	439,01	439,47	439,97	439,11	439,80
	439,57	438,89	439,00	439,48	439,96	439,11	439,79
	438,66	438,90	439,00	439,49	439,96	439,10	439,78
	438,66	438,91	438,99	439,50	439,95	439,09	439,77
1,00s	438,66	439,64	438,98	439,51	439,95	439,09	439,77
	438,66	439,65	438,97	439,52	439,94	439,08	439,76
	438,65	439,66	438,97	439,52	439,94	439,07	439,75
	438,65	439,67	438,96	439,53	439,94	439,07	439,75
	438,65	439,68	438,95	439,53	439,93	439,06	439,75
1,10s	438,65	439,70	438,94	439,53	439,93	439,06	439,75
	438,65	439,71	438,94	439,53	439,92	439,05	439,83
	438,65	439,72	438,93	439,53	439,91	439,05	439,83
	438,65	439,74	438,92	439,54	439,90	439,04	439,83
	438,64	439,75	438,92	439,54	439,89	439,04	439,83
1,20s	438,64	439,76	438,91	439,55	439,88	439,03	439,83
	438,64	439,78	438,91	439,56	439,87	439,03	439,83
	438,64	439,78	438,90	439,57	439,40	439,03	439,83
	438,64	439,79	438,90	438,56	439,38	439,03	439,84
	438,64	439,79	438,90	438,60	439,37	439,03	439,84
1,30s	438,64	439,78	438,90	438,61	439,36	439,03	439,85
	438,63	439,77	438,90	438,62	439,35	439,03	438,57
	438,63	439,76	438,90	438,63	439,34	439,03	438,57
	438,63	439,75	438,90	438,64	439,34	439,03	438,57
	438,63	439,76	438,90	438,65	439,33	439,03	438,57
1,40s	438,62	439,73	438,90	438,66	439,33	439,03	438,57
	438,62	439,73	438,90	438,67	439,32	439,03	438,57
	438,62	439,72	438,90	438,67	439,32	439,02	438,58
	438,61	439,71	438,90	438,68	439,01	439,02	438,58
	438,61	439,70	438,90	438,69	439,00	439,01	438,58
1,50s	438,61	439,69	438,89	438,69	438,98	439,00	438,58
	438,61	439,69	438,89	438,70	438,97	438,99	438,59
	438,61	439,68	438,89	438,70	438,95	438,98	438,59
	438,60	439,68	438,89	438,71	438,93	438,98	438,59
	438,60	439,67	438,89	438,71	438,90	438,97	438,59



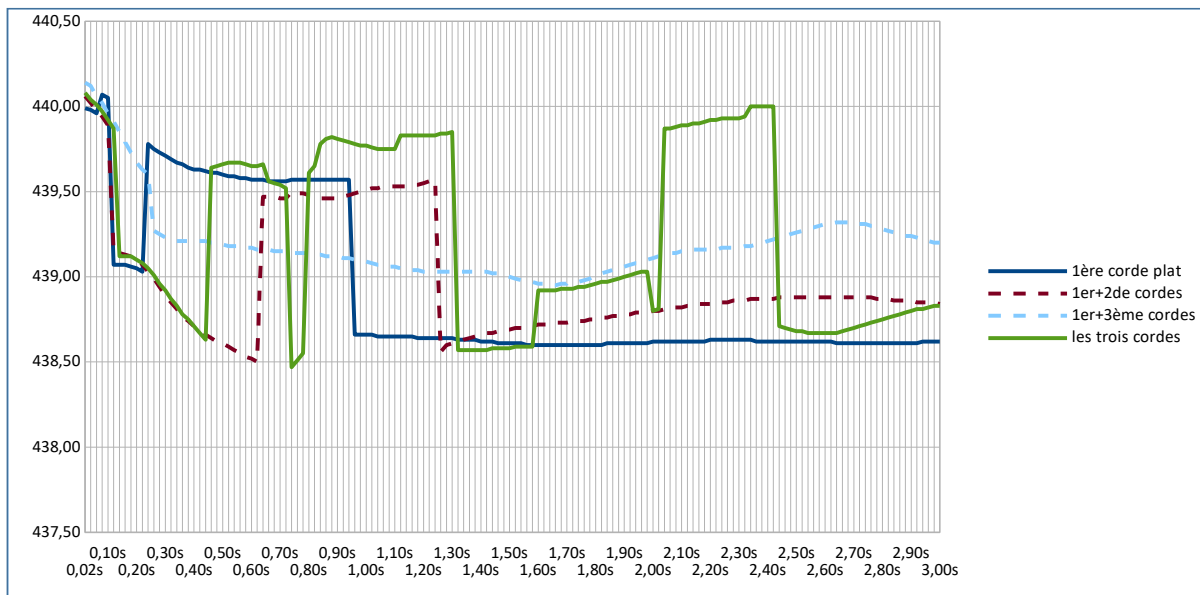
1,60s	438,60	1,60s	438,84	1,60s	438,88	1,60s	438,72	1,60s	439,84	1,60s	438,96	1,60s	438,92
	438,60		438,83		438,88		438,72		439,84		438,96		438,92
	438,60		438,83		438,87		438,72		439,83		438,95		438,92
	438,60		438,82		438,87		438,73		439,82		438,95		438,92
	438,60		438,81		438,87		438,73		439,82		438,96		438,93
1,70s	438,60	1,70s	438,81	1,70s	438,87	1,70s	438,73	1,70s	439,81	1,70s	438,96	1,70s	438,93
	438,60		438,80		438,87		438,74		439,81		438,97		438,93
	438,60		438,80		438,88		438,74		439,81		438,97		438,94
	438,60		438,79		438,88		438,74		439,82		438,98		438,94
	438,60		438,79		438,88		438,75		439,89		438,99		438,95
1,80s	438,60	1,80s	438,79	1,80s	438,89	1,80s	438,75	1,80s	439,90	1,80s	439,01	1,80s	438,96
	438,60		438,78		438,89		438,76		439,91		439,02		438,97
	438,61		438,78		438,90		438,76		439,92		439,03		438,97
	438,61		438,77		438,90		438,77		439,94		439,04		438,98
	438,61		438,77		438,91		438,77		439,95		439,05		438,99
1,90s	438,61	1,90s	438,76	1,90s	438,92	1,90s	438,78	1,90s	439,96	1,90s	439,06	1,90s	439,00
	438,61		438,76		438,92		438,78		439,98		439,07		439,01
	438,61		438,76		438,93		438,79		440,00		439,08		439,02
	438,61		438,75		438,94		438,79		440,04		439,09		439,03
	438,61		438,75		438,94		438,79		440,05		439,10		439,03
2,00s	438,62	2,00s	438,75	2,00s	438,95	2,00s	438,80	2,00s	438,50	2,00s	439,11	2,00s	438,80
	438,62		438,74		438,95		438,80		438,51		439,12		438,81
	438,62		438,74		438,96		438,81		438,53		439,13		439,87
	438,62		438,74		438,96		438,81		438,55		439,14		439,87
	438,62		438,74		438,97		438,82		438,56		439,14		439,88
2,10s	438,62	2,10s	438,74	2,10s	438,97	2,10s	438,82	2,10s	438,58	2,10s	439,15	2,10s	439,89
	438,62		438,73		438,97		438,83		438,59		439,15		439,89
	438,62		438,73		438,98		438,83		438,61		439,16		439,90
	438,62		438,73		438,98		438,84		438,62		439,16		439,90
	438,62		438,73		438,98		438,84		438,63		439,16		439,91
2,20s	438,63	2,20s	438,73	2,20s	438,99	2,20s	438,84	2,20s	438,64	2,20s	439,16	2,20s	439,92
	438,63		438,73		438,99		438,85		438,66		439,16		439,92
	438,63		438,73		438,99		438,85		438,67		439,17		439,93
	438,63		438,73		438,99		438,85		438,68		439,17		439,93
	438,63		438,73		438,99		438,86		438,69		439,17		439,93
2,30s	438,63	2,30s	438,73	2,30s	439,00	2,30s	438,86	2,30s	438,70	2,30s	439,17	2,30s	439,93
	438,63		438,73		439,00		438,86		438,71		439,18		439,94
	438,63		438,73		439,00		438,87		438,72		439,18		440,00
	438,62		438,73		439,00		438,87		438,73		439,19		440,00
	438,62		438,73		439,01		438,87		438,74		439,20		440,00
2,40s	438,62	2,40s	438,73	2,40s	439,01	2,40s	438,87	2,40s	438,75	2,40s	439,21	2,40s	440,00
	438,62		438,73		439,01		438,87		438,76		439,22		440,00
	438,62		438,73		439,01		438,88		438,76		439,23		438,71
	438,62		438,73		439,02		438,88		438,77		439,24		438,70
	438,62		438,72		439,02		438,88		438,78		439,25		438,69
2,50s	438,62	2,50s	438,72	2,50s	439,02	2,50s	438,88	2,50s	438,79	2,50s	439,26	2,50s	438,68
	438,62		438,72		439,03		438,88		438,79		439,27		438,68
	438,62		438,72		439,03		438,88		438,80		439,28		438,67
	438,62		438,72		439,03		438,88		438,80		439,29		438,67
	438,62		438,72		439,03		438,88		438,81		439,30		438,67
2,60s	438,62	2,60s	438,72	2,60s	439,03	2,60s	438,88	2,60s	438,82	2,60s	439,31	2,60s	438,67
	438,62		438,72		439,04		438,88		438,82		439,31		438,67
	438,61		438,72		439,04		438,88		438,83		439,32		438,67
	438,61		438,72		439,04		438,88		438,83		439,32		438,68
	438,61		438,72		439,04		438,88		438,84		439,32		438,69
2,70s	438,61	2,70s	438,72	2,70s	439,04	2,70s	438,88	2,70s	438,84	2,70s	439,32	2,70s	438,70
	438,61		438,72		439,05		438,88		438,85		439,31		438,71
	438,61		438,72		439,05		438,88		438,86		439,31		438,72
	438,61		438,71		439,05		438,88		438,86		439,30		438,73
	438,61		438,71		439,05		438,87		438,86		439,29		438,74
2,80s	438,61	2,80s	438,71	2,80s	439,05	2,80s	438,87	2,80s	438,87	2,80s	439,28	2,80s	438,75
	438,61		438,71		439,05		438,87		438,87		439,27		438,76
	438,61		438,71		439,06		438,86		438,88		439,26		438,77
	438,61		438,71		439,06		438,86		438,88		439,25		438,78
	438,61		438,71		439,06		438,86		438,88		439,24		438,79
2,90s	438,61	2,90s	438,71	2,90s	439,06	2,90s	438,86	2,90s	438,89	2,90s	439,24	2,90s	438,80
	438,61		438,71		439,06		438,85		438,89		439,23		438,81
	438,62		438,71		439,06		438,85		438,89		439,22		438,81
	438,62		438,71		439,06		438,85		438,90		439,21		438,82
	438,62		438,71		439,06		438,85		438,90		439,20		438,83
3,00s	438,62	3,00s	438,71	3,00s	439,06	3,00s	438,84	3,00s	438,90	3,00s	439,20	3,00s	438,83

delta en Hz :	1,41	1,23	1,16	1,56	1,3	1,05	1,61
soit en cents :	5,01	4,69	3,47	5,68	3,78	3,03	5,72
nb de valeurs différentes :	32	52	47	62	94	50	74

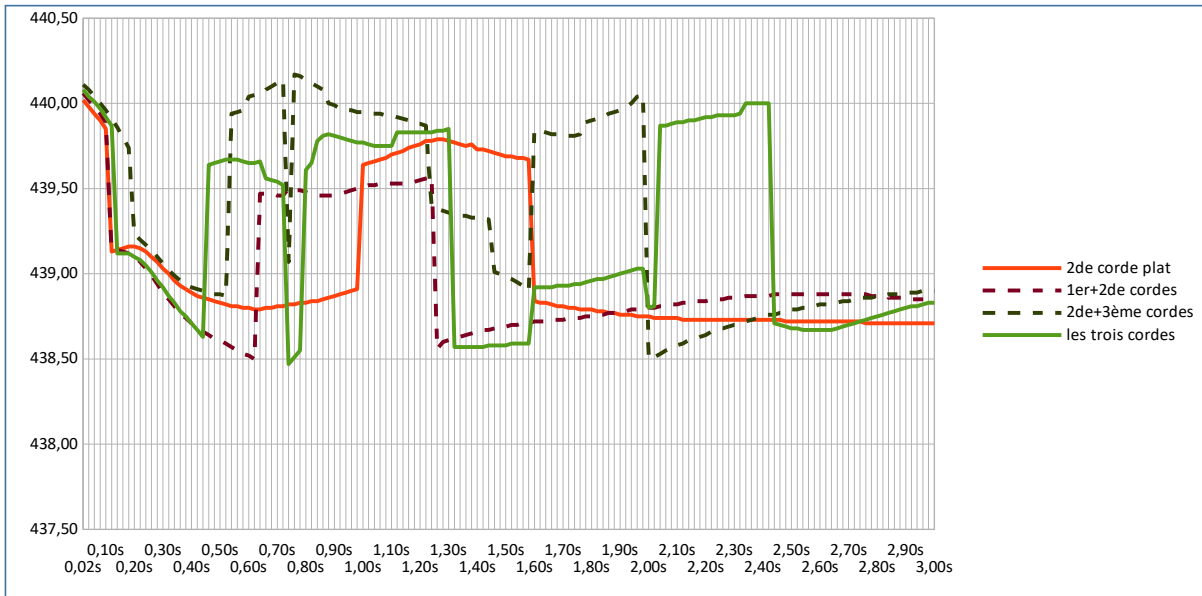
visualisation de la somme des trois cordes



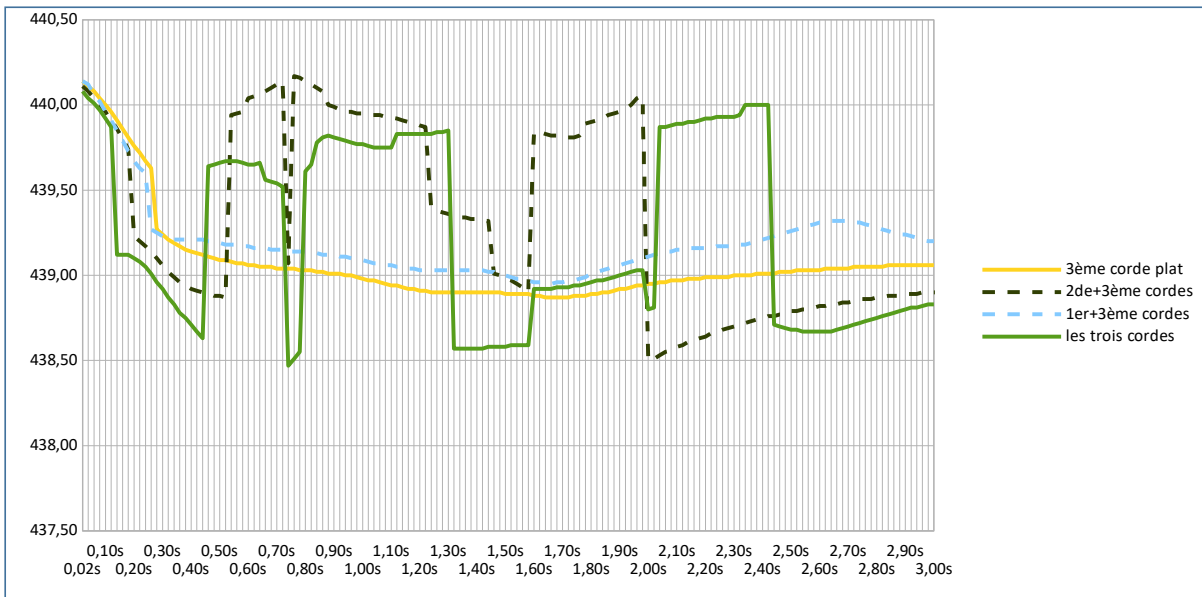
visualisation de l'interaction de la 1<sup>er</sup> corde



### visualisation de l'interaction de la 2de corde



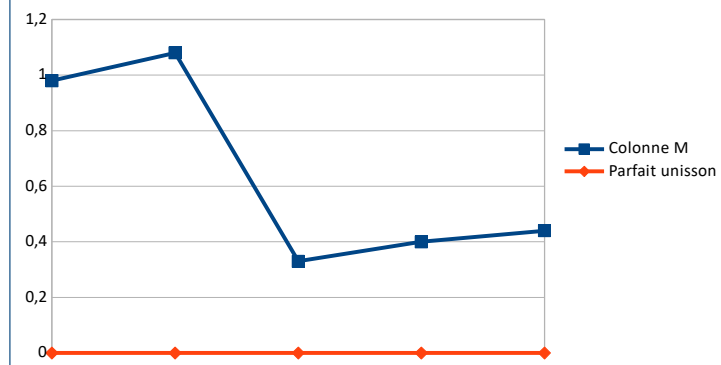
### visualisation de l'interaction de la 3ème corde



	1 <sup>ère</sup> corde	2 <sup>ème</sup> corde	3 <sup>ème</sup> corde
1,00s		438,66 439,64	438,98
1,50s		438,61 439,69	438,89
2,00s		438,62 438,75	438,95
2,50s		438,62 438,72	439,02
3,00s	438,62		

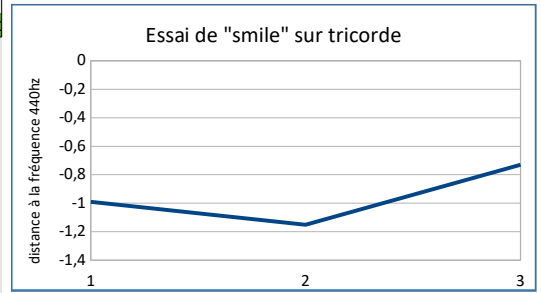
Vibratos des extrêmes.		Parfait unisson
Nbre de b/sec.		
1,00s	0,98	
1,50s	1,08	
2,00s	0,33	
2,50s	0,4	

### Unisson de tricorde



**Comportement de l'onde d'une et de trois cordes de piano façon « smile »**  
par tranche de 0,02s sur 3s

1ère corde smile		2de corde smile		3ème corde smile		les trois cordes	
	fréq. globale		fréq. globale		fréq. globale		fréq. globale
	A4=439,01Hz		A4=438,85Hz		A4=439,27Hz		A4=439,99Hz
0,02s	439,99	0,02s	439,99	0,02s	440,14	0,02s	440,05
	439,95		439,95		440,11		440,02
	439,91		439,90		440,08		439,98
	439,86		439,11		440,05		439,93
0,10s	439,81	0,10s	439,12	0,10s	440,01	0,10s	439,89
	439,76		439,13		439,97		439,11
	439,22		439,13		439,93		439,12
	439,22		439,13		439,88		439,12
	439,22		439,12		439,84		439,12
0,20s	439,21	0,20s	439,11	0,20s	439,80	0,20s	439,11
	439,19		439,09		439,76		439,09
	439,17		439,06		439,73		439,06
	439,14		439,03		439,71		439,03
	439,12		439,00		439,69		438,99
0,30s	439,10	0,30s	438,98	0,30s	439,67	0,30s	438,95
	439,08		438,95		439,65		438,92
	439,07		438,94		439,63		438,88
	439,06		438,92		439,62		438,85
	439,06		438,91		439,61		438,83
0,40s	439,06	0,40s	438,91	0,40s	439,60	0,40s	438,80
	439,06		438,90		439,59		438,78
	439,06		438,90		439,59		438,76
	439,06		438,89		439,58		438,74
	439,05		438,89		439,33		438,71
0,50s	439,05	0,50s	438,88	0,50s	439,33	0,50s	438,68
	439,05		438,88		439,32		438,64
	439,04		438,87		439,31		438,59
	439,04		438,87		439,31		438,53
	439,03		438,86		439,30		438,86
0,60s	439,03	0,60s	438,86	0,60s	439,29	0,60s	438,82
	439,03		438,86		439,29		438,78
	439,02		438,85		439,28		438,74
	439,02		438,85		439,28		438,72
	439,02		438,85		439,28		438,72
0,70s	439,01	0,70s	438,85	0,70s	439,27	0,70s	438,73
	439,01		438,85		439,27		438,76
	439,01		438,85		439,27		439,99
	439,01		438,85		439,27		439,99
	439,01		438,85		439,26		440,00
0,80s	439,01	0,80s	438,85	0,80s	439,26	0,80s	440,01
	439,01		438,85		439,26		440,02
	439,01		438,86		439,25		440,03
	439,01		438,86		439,25		440,04
	439,01		438,86		439,25		440,05
0,90s	439,01	0,90s	438,86	0,90s	439,24	0,90s	440,06
	439,01		438,87		439,24		440,07
	439,01		438,87		439,23		440,08
	439,01		438,87		439,23		440,09
	439,01		438,88		439,22		440,10
1,00s	439,01	1,00s	438,88	1,00s	439,22	1,00s	440,11
	439,01		438,89		439,21		440,11
	439,00		439,70		439,21		440,11
	439,00		439,71		439,20		440,10
	439,00		439,71		439,20		440,08
1,10s	439,00		439,72		439,19		440,06
	439,00		439,76		439,19		440,04
	439,00		439,74		439,18		440,02
	439,00		439,75		439,18		440,00
	439,00		439,77		439,17		439,99
1,20s	439,00		439,79		439,17		439,98
	439,00		439,81		439,17		439,99
	439,00		439,84		439,17		439,99
	439,00		439,88		439,17		440,00
	439,00		439,91		439,16		440,00
1,30s	439,00		439,91		439,16		440,01
	439,00		439,87		439,16		440,02
	439,00		439,84		439,16		440,02
	439,00		439,81		439,16		439,95
	439,00		439,79		439,16		439,95
1,40s	439,00		439,77		439,16		439,95
	439,00		439,76		439,16		439,95
	439,00		439,75		439,15		439,95
	439,00		439,74		439,15		439,95
	439,00		439,73		439,15		438,78
1,50s	439,00		439,72		439,15		438,79
	439,00		439,72		439,15		438,80
	439,00		438,85		439,15		438,81
	439,00		438,85		439,14		438,82
	439,00		438,84		439,14		438,82

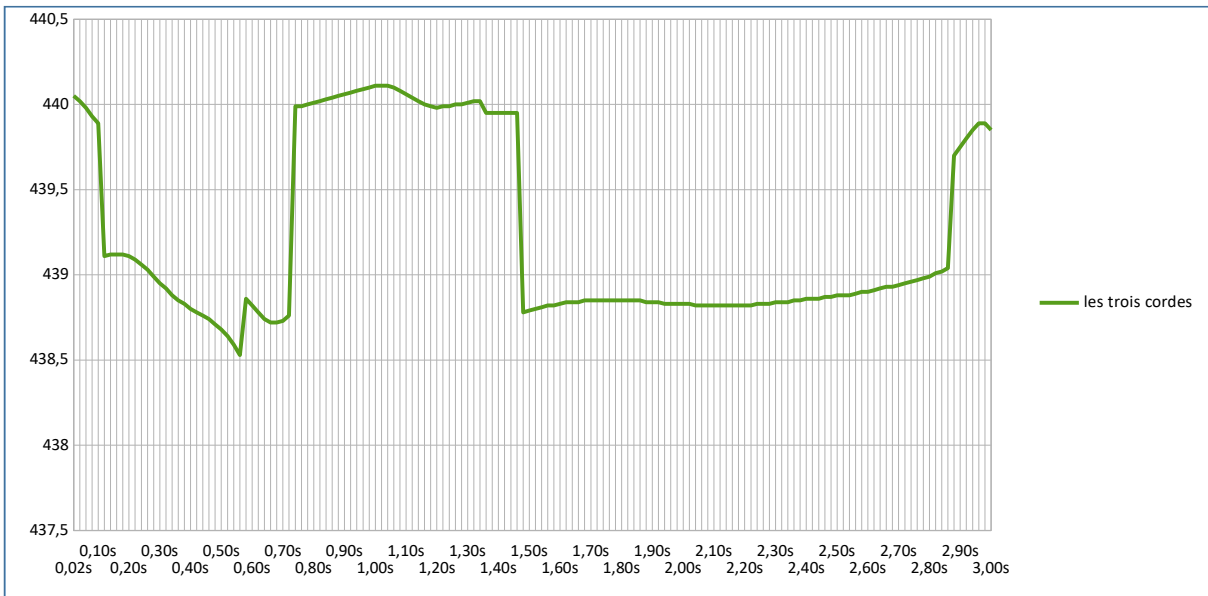
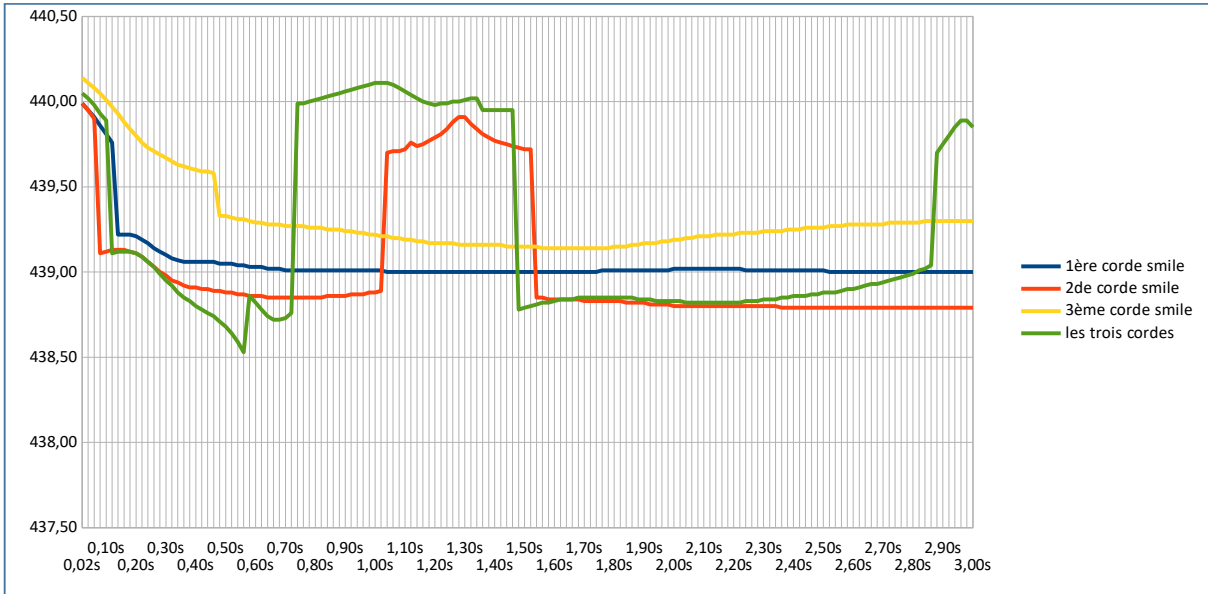


1,60s	439,00	438,84	439,14	438,83
	439,00	438,84	439,14	438,84
	439,00	438,84	439,14	438,84
	439,00	438,84	439,14	438,84
	439,00	438,84	439,14	438,85
1,70s	439,00	438,83	439,14	438,85
	439,00	438,83	439,14	438,85
	439,00	438,83	439,14	438,85
	439,01	438,83	439,14	438,85
	439,01	438,83	439,14	438,85
1,80s	439,01	438,83	439,15	438,85
	439,01	438,83	439,15	438,85
	439,01	438,82	439,15	438,85
	439,01	438,82	439,16	438,85
	439,01	438,82	439,16	438,84
1,90s	439,01	438,82	439,17	438,84
	439,01	438,81	439,17	438,84
	439,01	438,81	439,17	438,83
	439,01	438,81	439,18	438,83
	439,01	438,81	439,18	438,83
2,00s	439,02	438,80	439,19	438,83
	439,02	438,80	439,19	438,83
	439,02	438,80	439,20	438,82
	439,02	438,80	439,20	438,82
	439,02	438,80	439,21	438,82
2,10s	439,02	438,80	439,21	438,82
	439,02	438,80	439,21	438,82
	439,02	438,80	439,22	438,82
	439,02	438,80	439,22	438,82
	439,02	438,80	439,22	438,82
2,20s	439,02	438,80	439,22	438,82
	439,02	438,80	439,23	438,82
	439,01	438,80	439,23	438,83
	439,01	438,80	439,23	438,83
	439,01	438,80	439,23	438,83
2,30s	439,01	438,80	439,24	438,84
	439,01	438,80	439,24	438,84
	439,01	438,80	439,24	438,84
	439,01	438,79	439,24	438,85
	439,01	438,79	439,25	438,85
2,40s	439,01	438,79	439,25	438,86
	439,01	438,79	439,25	438,86
	439,01	438,79	439,26	438,86
	439,01	438,79	439,26	438,87
	439,01	438,79	439,26	438,87
2,50s	439,01	438,79	439,26	438,88
	439,00	438,79	439,27	438,88
	439,00	438,79	439,27	438,88
	439,00	438,79	439,27	438,89
	439,00	438,79	439,28	438,90
2,60s	439,00	438,79	439,28	438,90
	439,00	438,79	439,28	438,91
	439,00	438,79	439,28	438,92
	439,00	438,79	439,28	438,93
	439,00	438,79	439,28	438,93
2,70s	439,00	438,79	439,28	438,94
	439,00	438,79	439,29	438,95
	439,00	438,79	439,29	438,96
	439,00	438,79	439,29	438,97
	439,00	438,79	439,29	438,98
2,80s	439,00	438,79	439,29	438,99
	439,00	438,79	439,29	439,01
	439,00	438,79	439,30	439,02
	439,00	438,79	439,30	439,04
	439,00	438,79	439,30	439,04
2,90s	439,00	438,79	439,30	439,75
	439,00	438,79	439,30	439,80
	439,00	438,79	439,30	439,85
	439,00	438,79	439,30	439,89
	439,00	438,79	439,30	439,89
3,00s	439,00	438,79	439,30	439,85

delta en Hz :	0,98	1,14	0,92	1,58
soit en cents :	3,86	4,49	2,52	5,36

nb de valeurs différentes :	22	41	42	60
nd de changements de valeurs	26	55	58	97

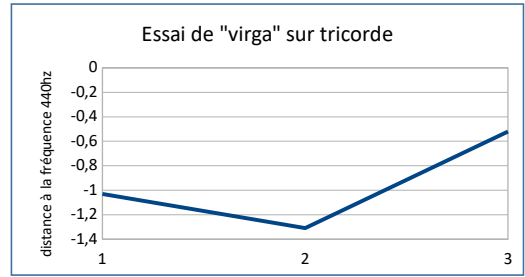
visualisation de l'interaction des trois cordes sur leur propre somme





**Comportement de l'onde d'une et de trois cordes de piano façon « virga »**  
par tranche de 0,02s sur 3s

1ère corde virga		2de corde virga		3ème corde virga		les trois cordes	
	fréq. globale		fréq. globale		fréq. globale		fréq. globale
	A4=439,11Hz		A4=438,83Hz		A4=439,62Hz		A4=440,14Hz
0,02s	440,01	0,02s	438,98	0,02s	440,15	0,02s	440,08
	439,97		439,00		440,13		440,05
	439,93		439,01		440,10		440,01
	439,89		439,02		440,07		439,96
0,10s	439,84	0,10s	439,04	0,10s	440,03	0,10s	439,91
	439,79		439,05		440,00		439,86
	439,74		439,06		439,96		439,15
	439,69		439,06		439,92		439,15
	439,28		439,06		439,88		439,15
0,20s	439,27	0,20s	439,06	0,20s	439,85	0,20s	439,13
	439,26		439,04		439,82		439,11
	439,24		439,02		439,80		439,08
	439,22		438,99		439,79		439,05
	439,20		438,97		439,77		439,02
0,30s	439,19	0,30s	438,94	0,30s	439,76	0,30s	438,98
	439,18		438,92		439,74		438,95
	439,17		438,91		439,73		438,92
	439,17		438,89		439,72		438,89
	439,17		438,88		439,70		438,86
0,40s	439,17	0,40s	438,88	0,40s	439,69	0,40s	438,83
	439,17		438,87		439,69		438,80
	439,17		438,87		439,68		438,77
	439,16		438,87		439,67		438,72
	439,16		438,86		439,66		438,67
0,50s	439,16	0,50s	438,86	0,50s	439,66	0,50s	438,60
	439,15		438,86		439,65		438,52
	439,15		438,85		439,64		438,44
	439,14		438,85		439,64		438,35
	439,14		438,85		439,63		440,11
0,60s	439,13	0,60s	438,85	0,60s	439,63	0,60s	440,08
	439,13		438,84		439,62		440,08
	439,12		438,84		439,62		440,08
	439,12		438,84		439,62		440,08
	439,12		438,84		439,62		440,10
0,70s	439,11	0,70s	438,84	0,70s	439,62	0,70s	440,11
	439,11		438,84		439,62		440,13
	439,11		438,83		439,62		440,14
	439,11		438,83		439,62		440,16
	439,11		438,83		439,61		440,16
0,80s	439,11	0,80s	438,83	0,80s	439,61	0,80s	440,16
	439,11		438,83		439,61		440,16
	439,11		438,83		439,60		440,16
	439,11		438,83		439,59		440,16
	439,11		438,83		439,59		440,17
0,90s	439,11	0,90s	438,83	0,90s	439,59	0,90s	440,18
	439,10		438,83		439,32		440,19
	439,10		438,83		439,32		440,21
	439,10		438,83		439,31		440,23
1,00s	439,10	1,00s	438,83	1,00s	439,31	1,00s	439,59
	439,10		438,82		439,30		439,61
	439,10		439,70		439,30		439,64
	439,10		439,70		439,29		439,67
	439,10		439,71		439,29		439,71
1,10s	439,10		439,71		439,28		439,75
	439,10		439,72		439,28		439,80
	439,10		439,73		439,27		439,86
	439,10		439,74		439,27		439,93
	439,10		439,75		439,27		439,99
1,20s	439,10		439,76		439,26		440,01
	439,10		439,78		439,26		439,96
	439,10		439,80		439,26		439,90
	439,10		439,83		439,26		439,84
	439,10		439,84		439,26		439,79
1,30s	439,10		439,85		439,25		439,75
	439,10		439,83		439,25		439,59
	439,10		439,81		439,25		439,11
	439,10		439,79		439,25		439,08
1,40s	439,10		439,77		439,25		439,07
	439,10		439,76		439,25		439,05
	439,10		439,75		439,24		439,04
	439,09		439,74		439,24		439,03
	439,09		439,73		439,24		439,02
	439,09		439,73		439,24		439,02
1,50s	439,09		439,72		439,23		439,01
	439,09		439,72		439,23		439,00
	439,09		438,81		439,23		439,00
	439,09		438,82		439,22		439,00
	439,09		438,82		439,22		438,99

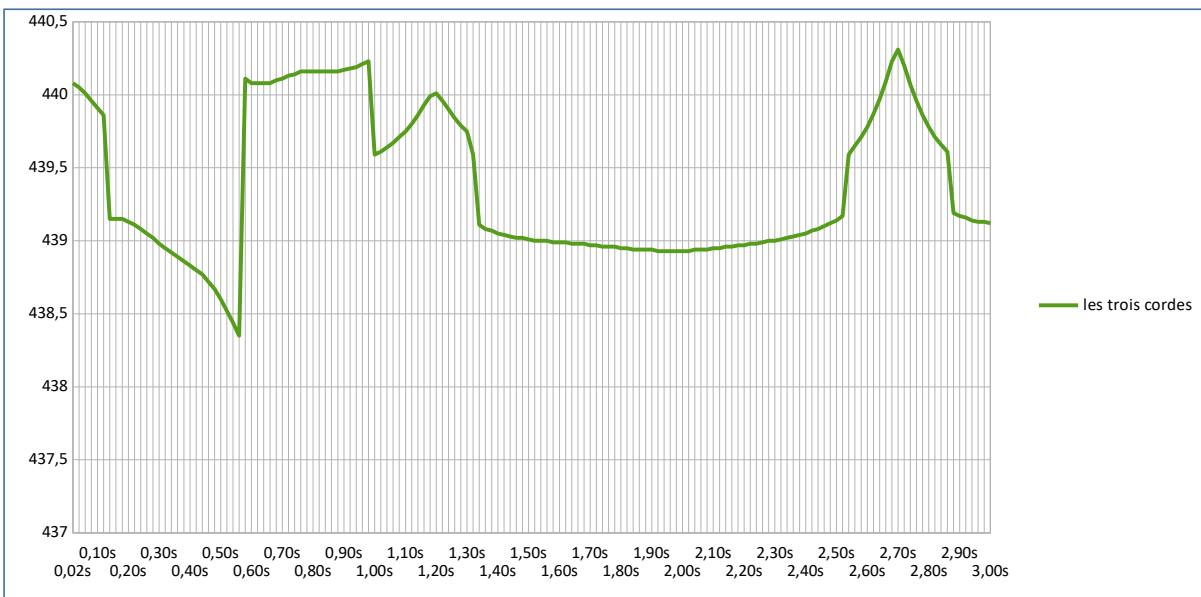
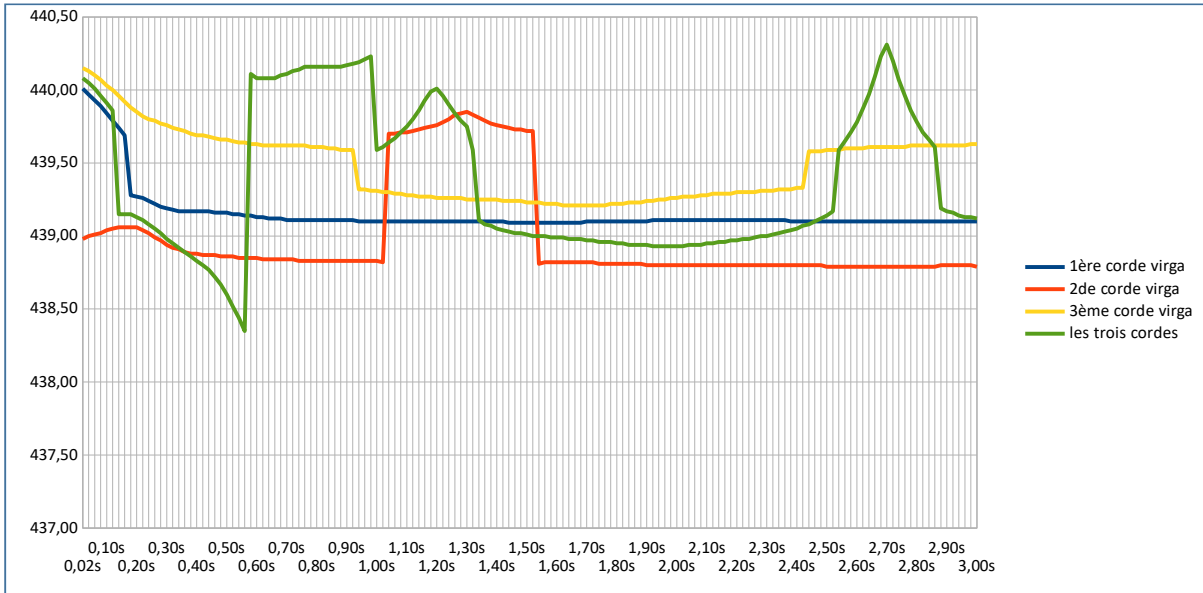


1,60s	439,09	438,82	439,22	438,99
	439,09	438,82	439,21	438,99
	439,09	438,82	439,21	438,98
	439,09	438,82	439,21	438,98
	439,09	438,82	439,21	438,98
1,70s	439,10	438,82	439,21	438,97
	439,10	438,82	439,21	438,97
	439,10	438,81	439,21	438,96
	439,10	438,81	439,21	438,96
	439,10	438,81	439,22	438,96
1,80s	439,10	438,81	439,22	438,95
	439,10	438,81	439,22	438,95
	439,10	438,81	439,23	438,94
	439,10	438,81	439,23	438,94
	439,10	438,81	439,23	438,94
1,90s	439,10	438,80	439,24	438,94
	439,11	438,80	439,24	438,93
	439,11	438,80	439,25	438,93
	439,11	438,80	439,25	438,93
	439,11	438,80	439,26	438,93
2,00s	439,11	438,80	439,26	438,93
	439,11	438,80	439,27	438,93
	439,11	438,80	439,27	438,94
	439,11	438,80	439,27	438,94
	439,11	438,80	439,28	438,94
2,10s	439,11	438,80	439,28	438,95
	439,11	438,80	439,29	438,95
	439,11	438,80	439,29	438,96
	439,11	438,80	439,29	438,96
	439,11	438,80	439,29	438,97
2,20s	439,11	438,80	439,30	438,97
	439,11	438,80	439,30	438,98
	439,11	438,80	439,30	438,98
	439,11	438,80	439,30	438,99
	439,11	438,80	439,31	439,00
2,30s	439,11	438,80	439,31	439,00
	439,11	438,80	439,31	439,01
	439,11	438,80	439,32	439,02
	439,11	438,80	439,32	439,03
	439,10	438,80	439,32	439,04
2,40s	439,10	438,80	439,33	439,05
	439,10	438,80	439,33	439,07
	439,10	438,80	439,58	439,08
	439,10	438,80	439,58	439,10
	439,10	438,80	439,58	439,12
2,50s	439,10	438,79	439,59	439,14
	439,10	438,79	439,59	439,17
	439,10	438,79	439,59	439,59
	439,10	438,79	439,60	439,65
	439,10	438,79	439,60	439,71
2,60s	439,10	438,79	439,60	439,78
	439,10	438,79	439,60	439,87
	439,10	438,79	439,61	439,97
	439,10	438,79	439,61	440,09
	439,10	438,79	439,61	440,23
2,70s	439,10	438,79	439,61	440,31
	439,10	438,79	439,61	440,20
	439,10	438,79	439,61	440,07
	439,10	438,79	439,61	439,96
	439,10	438,79	439,62	439,86
2,80s	439,10	438,79	439,62	439,78
	439,10	438,79	439,62	439,71
	439,10	438,79	439,62	439,66
	439,10	438,79	439,62	439,61
	439,10	438,80	439,62	439,19
2,90s	439,10	438,80	439,62	439,17
	439,10	438,80	439,62	439,16
	439,10	438,80	439,62	439,14
	439,10	438,80	439,62	439,13
	439,10	438,80	439,63	439,13
3,00s	439,10	438,79	439,63	439,12

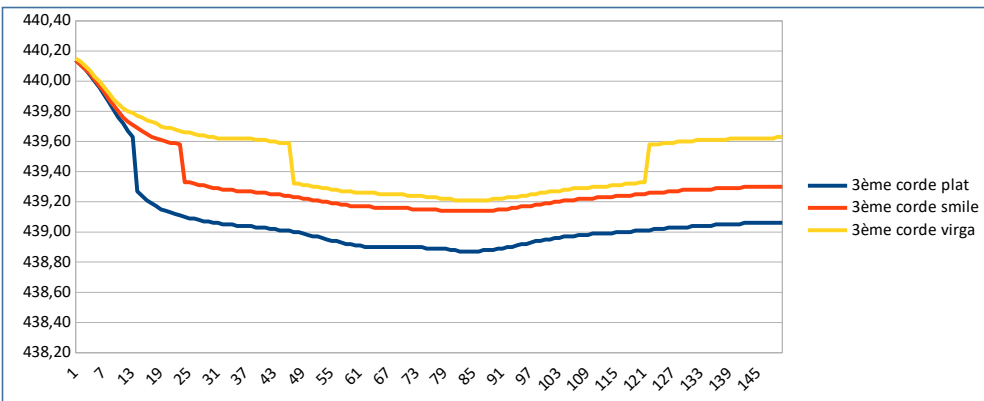
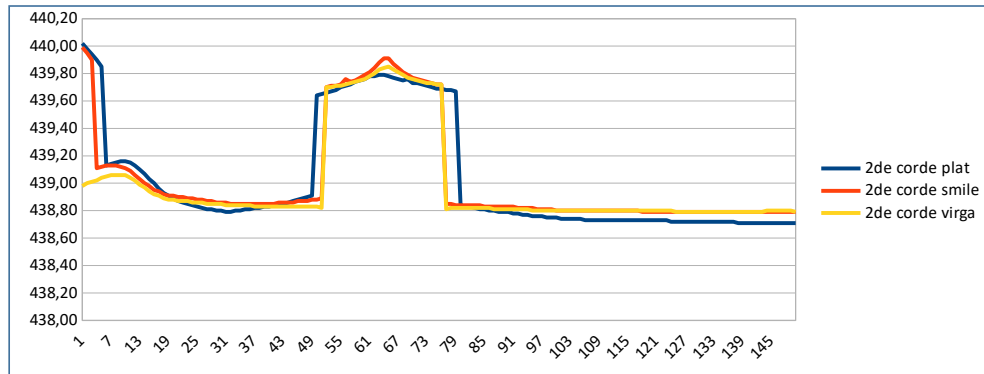
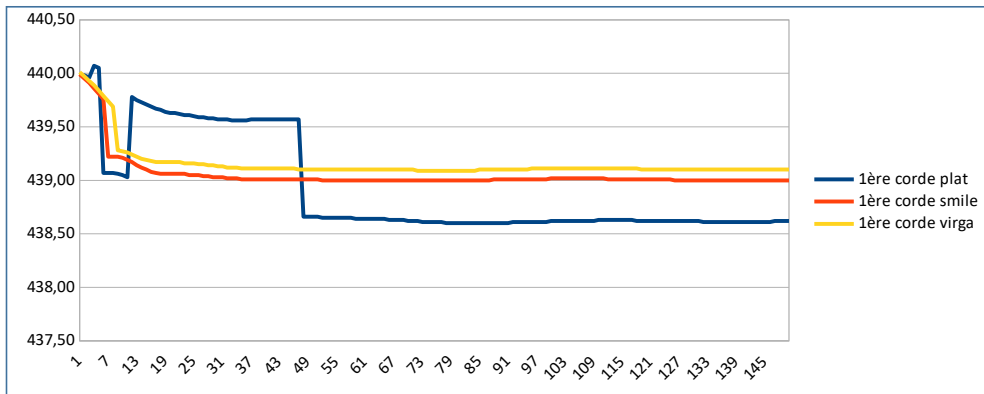
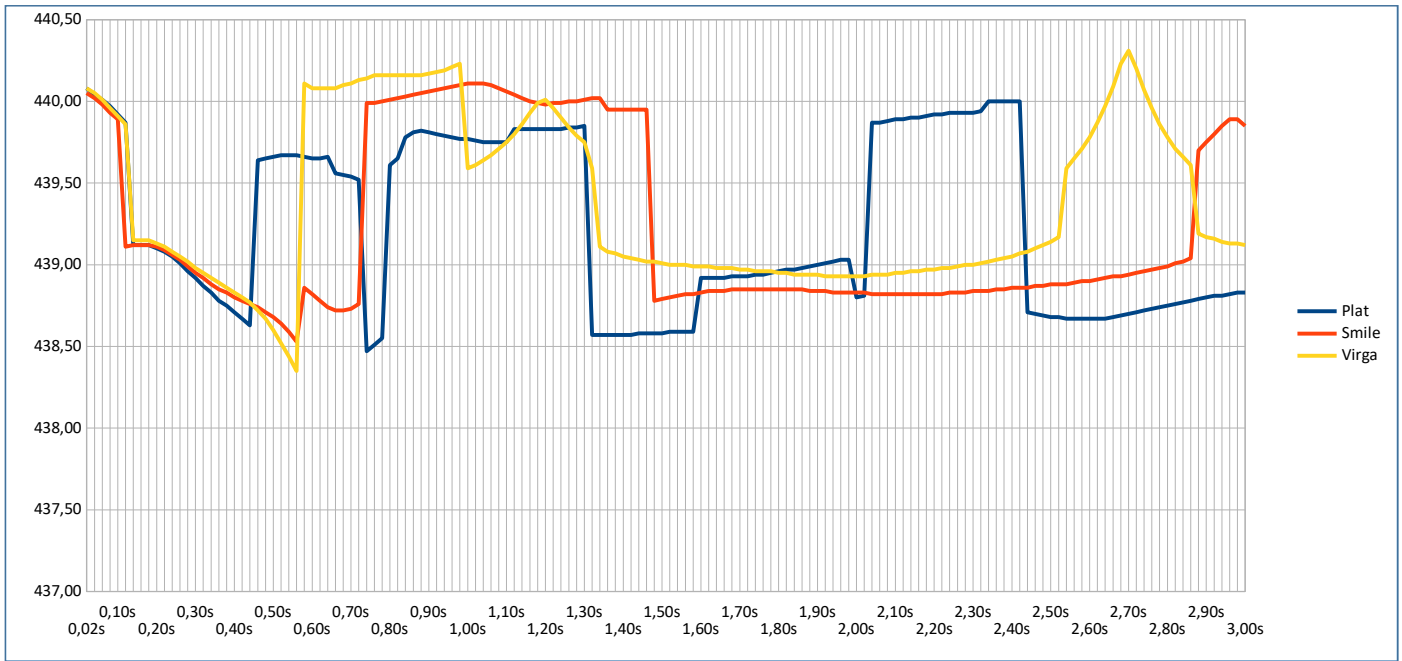
delta en Hz :	0,91	0,23	0,84	1,88
soit en cents :	3,51	0,91	2,13	5,60

nb de valeurs différentes :	25	38	44	73
nd de changements de valeurs	28	50	60	113

visualisation de l'interaction des trois cordes sur leur propre somme



comparaison du comportement d'un tricorde accordée de trois façons différentes :



**Protocole :**

- A. enregistrement des 1<sup>er</sup>, 2<sup>e</sup> puis 3<sup>e</sup> cordes, avant d'enregistrer simultanément les trois cordes.
- B. adobe audition cs6  
fenêtre Blackman  
TFR : 65536  
résolution spectrale : 16384  
96000 Hz 24bit
- C. OpenOffice
- D. incertitude d'Heisenberg

**Remarques :**

pourquoi sur 1,5s : sur 3s les modulations de certaines cordes sont si importante que le calcul de la freqs globale n'est pas représentatif de l'accord voulu et effectué par l'accordeur. (à savoir « identique » « smile » et « virga »)

pourquoi par tranche de 0,02s : après plusieurs essais, il est apparu que 0,02s était la tranche de temps qui offrait un compromis acceptable temps/fluctuation

les inconnus :

- 1 quelle corde est doublée , quelle ne l'est pas ?
- 2 et quand elles sont doublées, laquelle est accordée en dernier ?
- 3 et donc l'influence de la tension d'une corde sur sa voisine
- 4 un accord a été réalisé la veille, les deux autres le jour même : cela joue sur la tenue des notes...
- 5 manque aussi le diapason
- 6 influence de la fréquence de résonance des cordes sur leur accord
- 7 pour calculer le fréquence globale d'une note en prenant en compte l'incertitude d'Heisenberg, doit on prendre l'attaque ?

**« Incertitude et Heisenberg »**

Entrées :		sorties :	
Précision en cent(s) voulue :	0,25	précision en fréquence (Hz)	0,06354308
fréquence de travail (Hz):	440	correspondance : durée minimale d'analyse du signal (s):	1,25233892
durée d'analyse du signal (s):	1,5	précision en cent(s) obtenue	0,20872564
		précision en vitesse de battements (Hz) :	0,05305165