

## *APPENDIX I*

### The Harmonic Series

The following is a representation of the harmonic series, rounded to the nearest quarter-tone. The 118 partials are numbered upwards from the C1 fundamental, which is numbered '1'.

The image displays the harmonic series of a C1 fundamental, with 118 partials numbered 1 through 118. The notes are arranged in five systems, each consisting of a treble and bass staff. The notes are rounded to the nearest quarter-tone. The series is divided into sections by octave markers: 8va (8th octave) and 15ma (15th octave).

System 1 (Partials 1-23):

- Partial 1: C1 (Fundamental)
- Partials 2-23: Subharmonics and harmonics in the first octave.

System 2 (Partials 24-47):

- Partials 24-47: Harmonics in the second octave.

System 3 (Partials 48-70):

- 8va.....
- Partials 48-70: Harmonics in the eighth octave.

System 4 (Partials 71-94):

- 8va.....
- Partials 71-94: Harmonics in the eighth octave.

System 5 (Partials 95-118):

- 15ma.....
- Partials 95-118: Harmonics in the 15th octave.

## ***APPENDIX II*** **Piano Spectrum**

The following is a reproduction of Murail's spectral analysis of a piano note.<sup>1</sup> The left column lists the partial number (where the fundamental is C1), and the right column gives the relative amplitude (relative to the loudest partial, which has an amplitude of 1). The chart is dated March 1, 1983, and was reproduced in Murail's 1984 article.<sup>2</sup>

Murail's chart starts with the second partial, and omits partials 79, 97, 103, 105, 107, 109, 111, and 113. The highlighted partials are those used by Murail to construct the timbre/chords in the first section of *Désintégrations*.

2	1.000000
3	0.263176
4	0.501411
5	0.544941
6	0.543653
7	0.964906
8	0.004356
9	0.234125
10	0.410792
11	0.869808
12	0.702620
13	0.703479
14	0.030799
15	0.275385
16	0.009540
17	0.239186
18	0.194920
19	0.394687
20	0.260476
21	0.690779
22	0.187619

23	0.314130
24	0.016412
25	0.048377
26	0.053838
27	0.345389
28	0.340021
29	0.483649
30	0.285539
31	0.052427
32	0.006994
33	0.056200
34	0.081938
35	0.168016
36	0.112062
37	0.196270
38	0.100190
39	0.043469
40	0.013191
41	0.031904
42	0.119517
43	0.120805

<sup>1</sup> Murail, "Notes sur *Désintégrations*", 12.

<sup>2</sup> Murail, "Spectra and pixies", 162. The chart in the article only reproduces the first 50 partials.

44	0.026597
45	0.050187
46	0.019848
47	0.029756
48	0.006626
49	0.010768
50	0.024480
51	0.075465
52	0.031321
53	0.035861
54	0.035033
55	0.010093
56	0.003957
57	0.015124
58	0.003374
59	0.012025
60	0.017915
61	0.006197
62	0.003098
63	0.007117
64	0.021382
65	0.018345
66	0.005859
67	0.002178
68	0.014817
69	0.006013
70	0.000736
71	0.019050
72	0.016075
73	0.014663
74	0.000215
75	0.008589
76	0.005307
77	0.001012

78	0.004387
80	0.000552
81	0.003528
82	0.001288
83	0.001810
84	0.003743
85	0.004908
86	0.000920
87	0.001963
88	0.000951
89	0.001380
90	0.000307
91	0.001871
92	0.000644
93	0.000736
94	0.000951
95	0.002025
96	0.002055
98	0.009847
99	0.000276
100	0.000276
101	0.001135
102	0.000736
104	0.000620
106	0.000368
108	0.000399
110	0.000215
112	0.000522
114	0.000982
115	0.000245
116	0.001841
117	0.000920
118	0.000706