

Composition: Electronic Media I

Sept. 26, 2007

Fourier Analysis

1. Background

- a. Jean-Baptiste Fourier

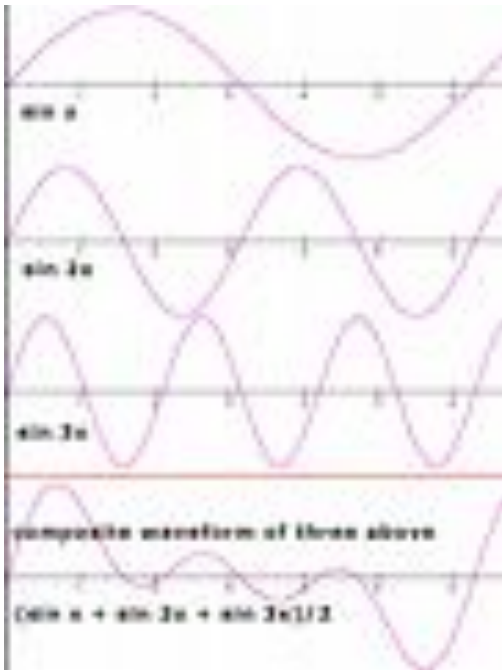


- b. *On the Propagation of Heat in Solid Bodies* (1807)
c. Any periodic wave can be represented as a sum of sine waves whose frequencies are integral multiples, and whose amplitudes and phases are properly adjusted.

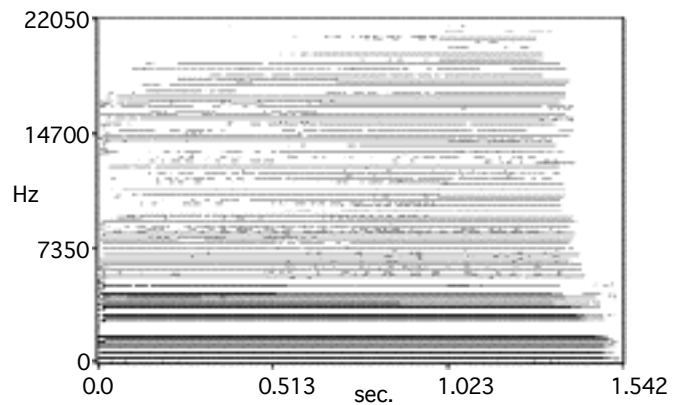
3. Fourier series for middle C, where $f = 261.65$ Hz

12f	3139.80 Hz	
11f	2878.15 Hz	
10f	2616.50 Hz	
9f	2354.85 Hz	
8f	2093.20 Hz	
7f	1831.55 Hz	
6f	1569.90 Hz	
5f	1308.25 Hz	
4f	1046.60 Hz	
3f	784.95 Hz	
2f	523.30 Hz	
1f	261.65 Hz	C4

4. Representation of a complex wave produced by interference of sine waves.



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5. Spectrogram of an Oboe playing F4.