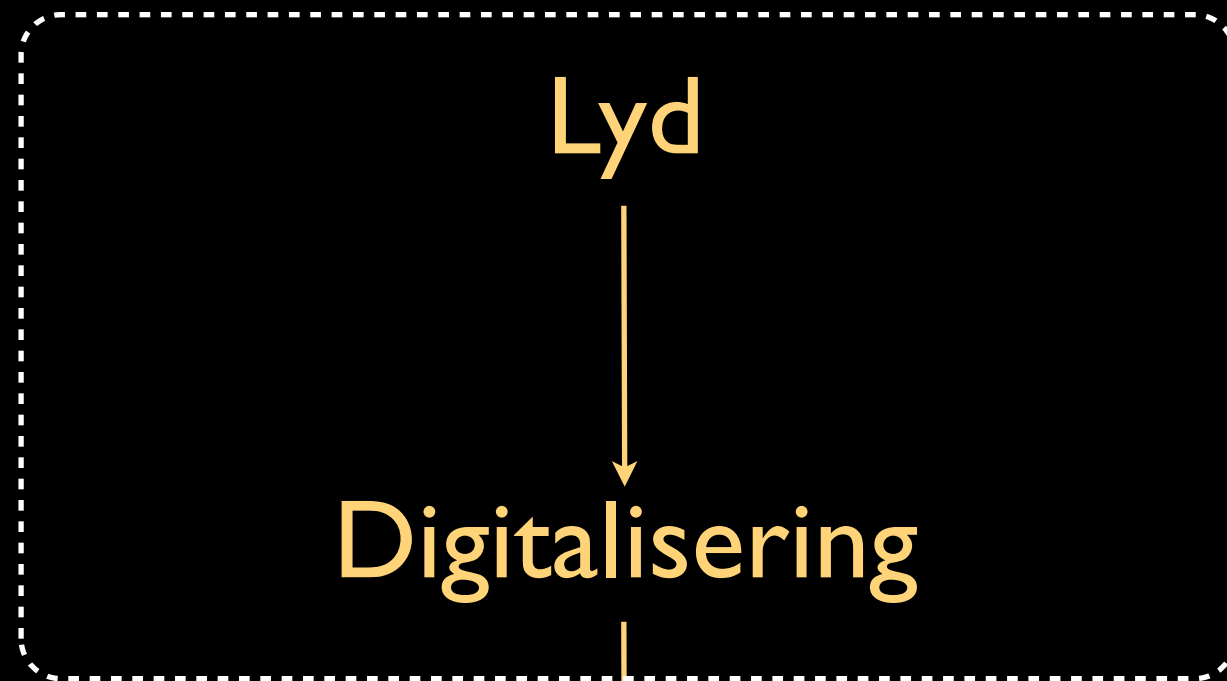


Visualisering av lyd

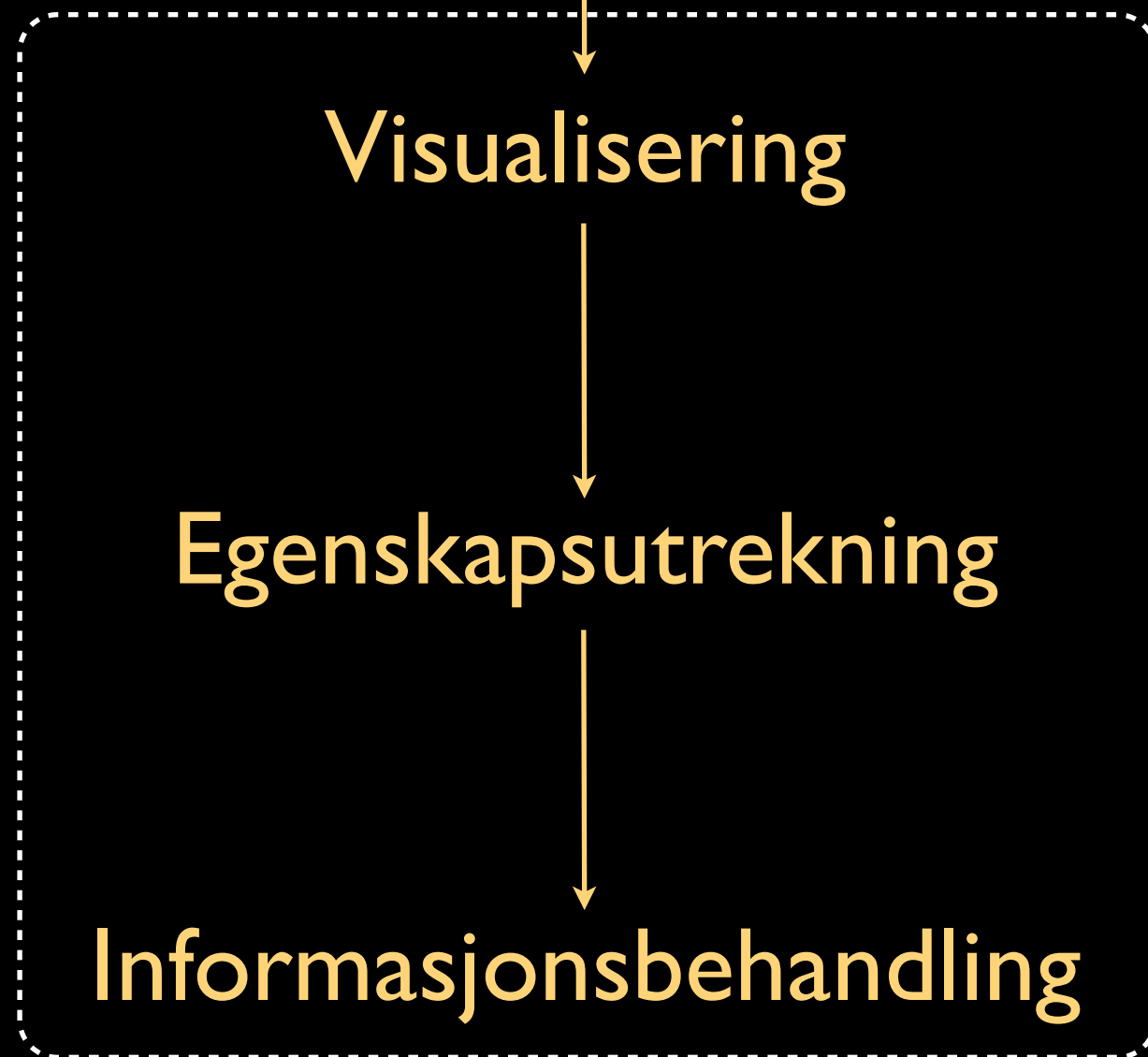
Lydanalyse (MUS4831) H2010

Alexander Refsum Jensenius

Universitetet i Oslo



Lydteori

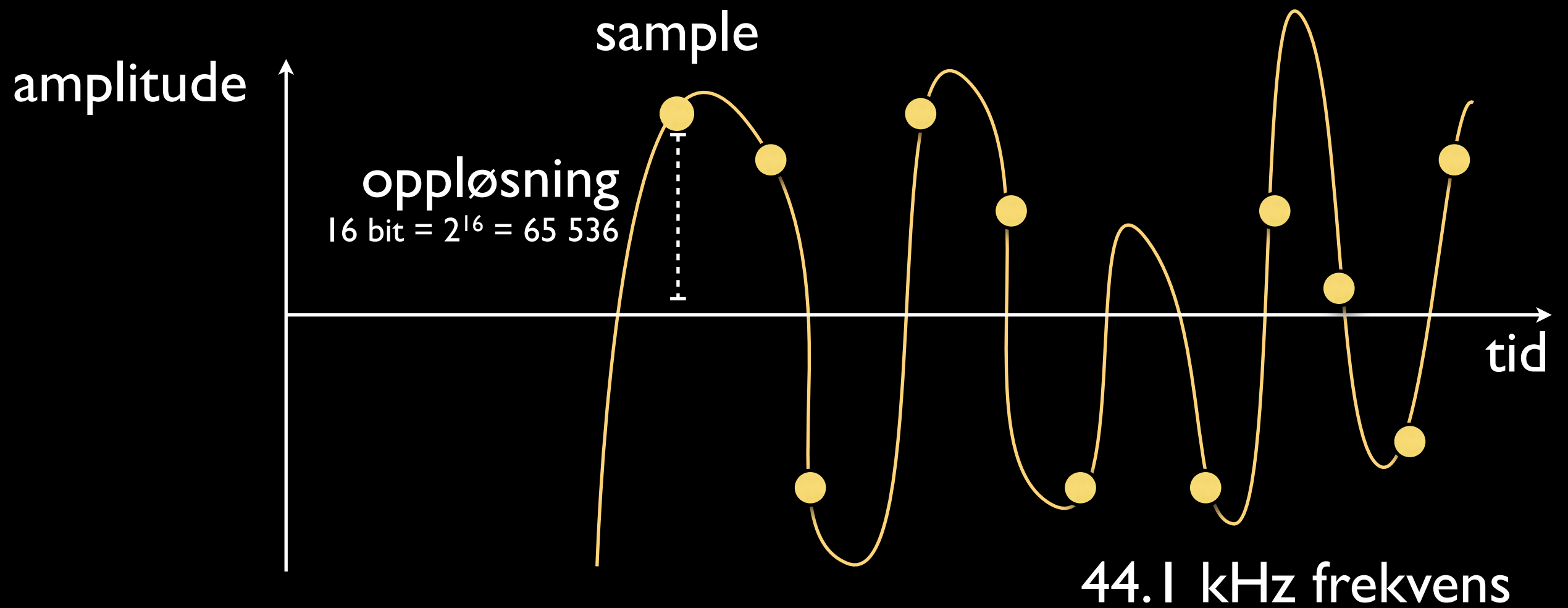
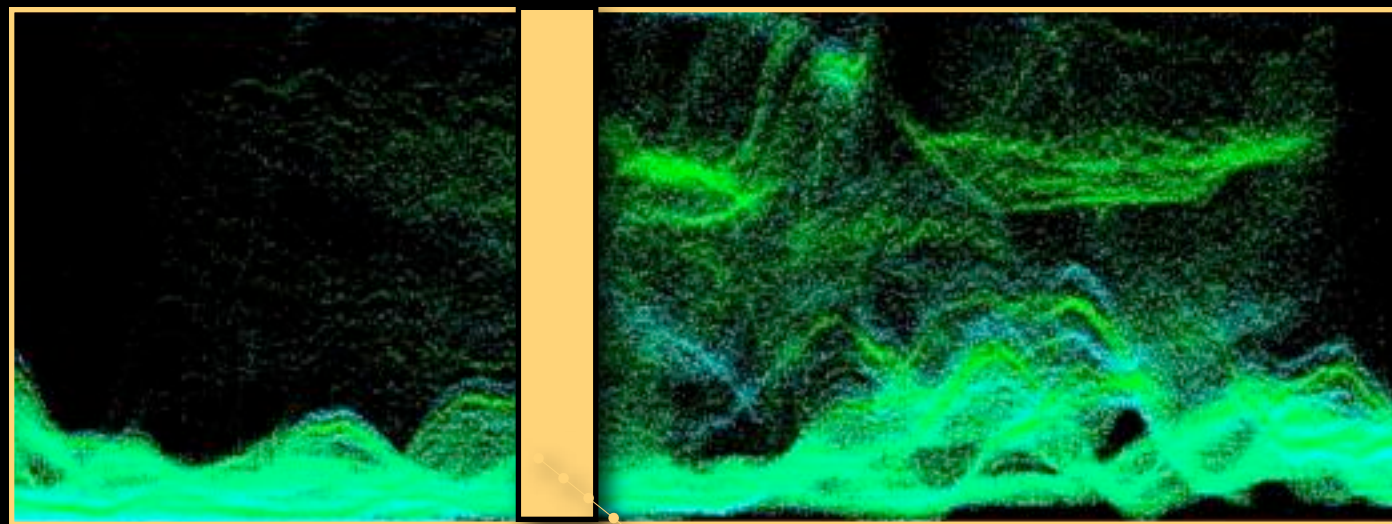


Lydanalyse

Lyd

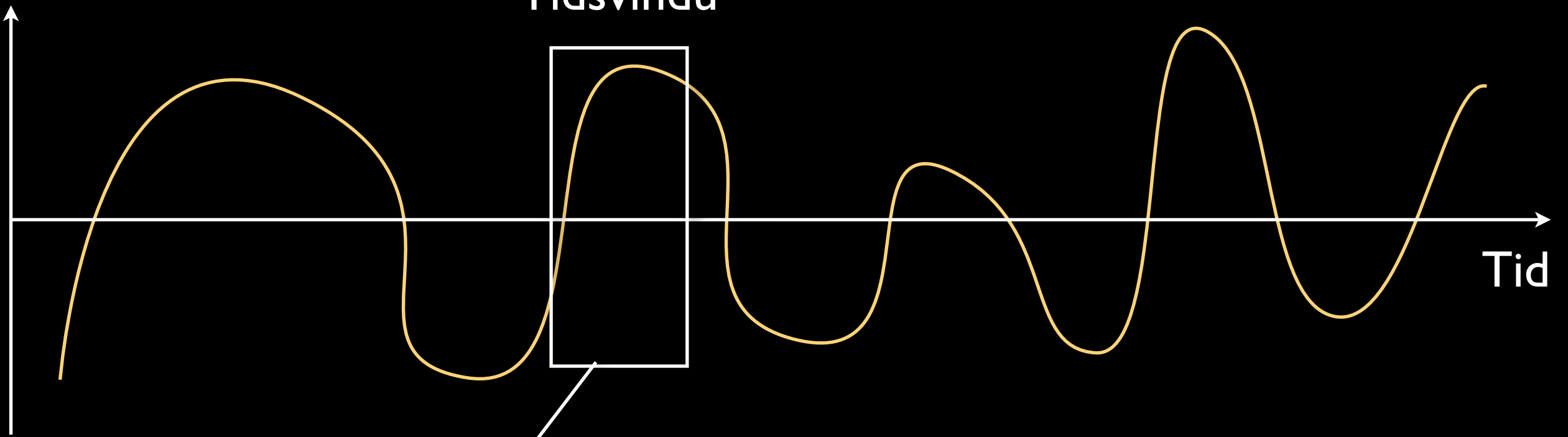


Digitalisering



Amplitude

Tidsvindu

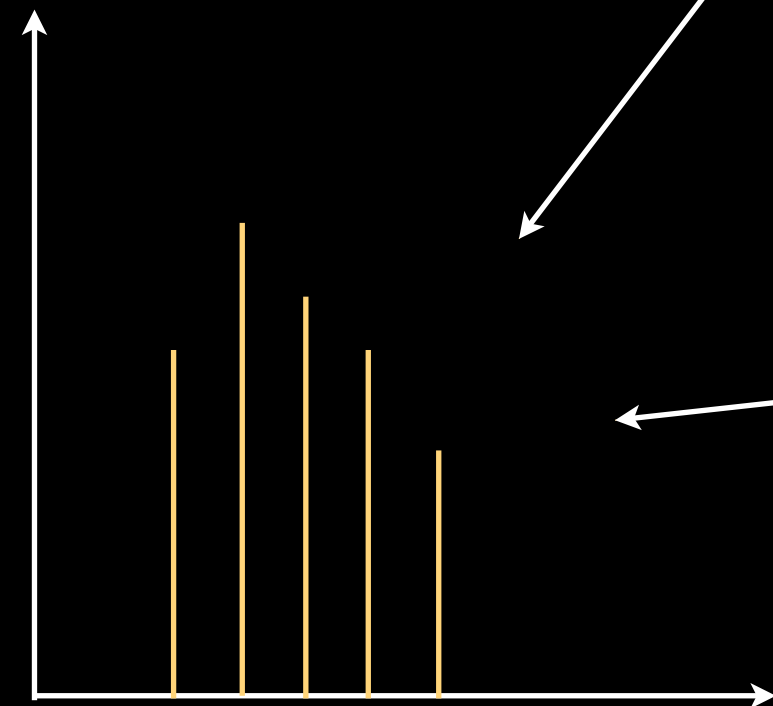


Tid

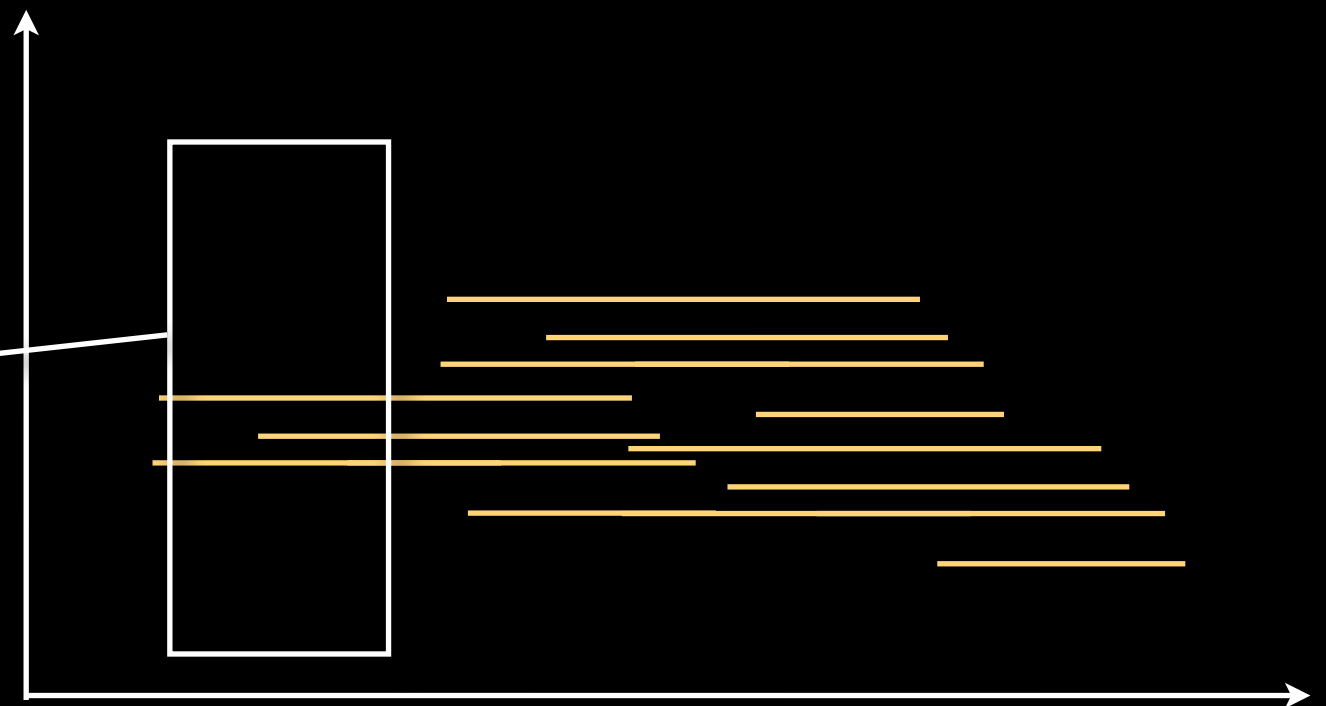
Amplitude

FFT

Frekvens

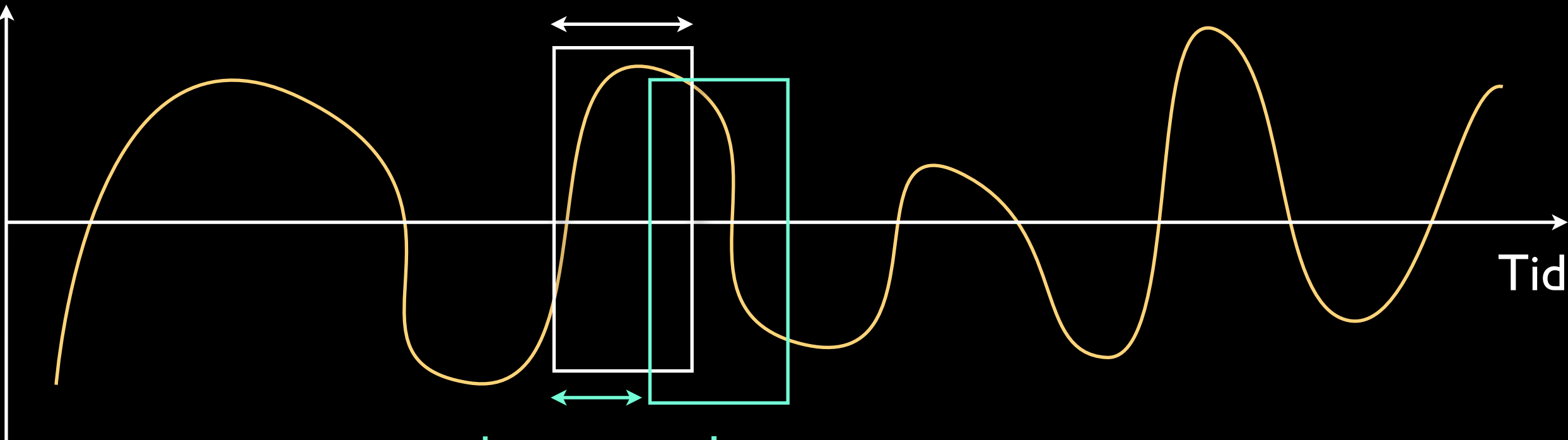


Frekvens



Tid

Amplitude



vindusstørrelse

hop-størrelse

Tid

Begreper

Vindusstørrelse

Oppløsning

Lineær/logaritmisk

Visualisering

Bølgeform

Spektrum

Spektrogram

Programmer

SoundAnalysis

Audacity

SonicVisualiser

SPEAR

Praat

PureData

Matlab

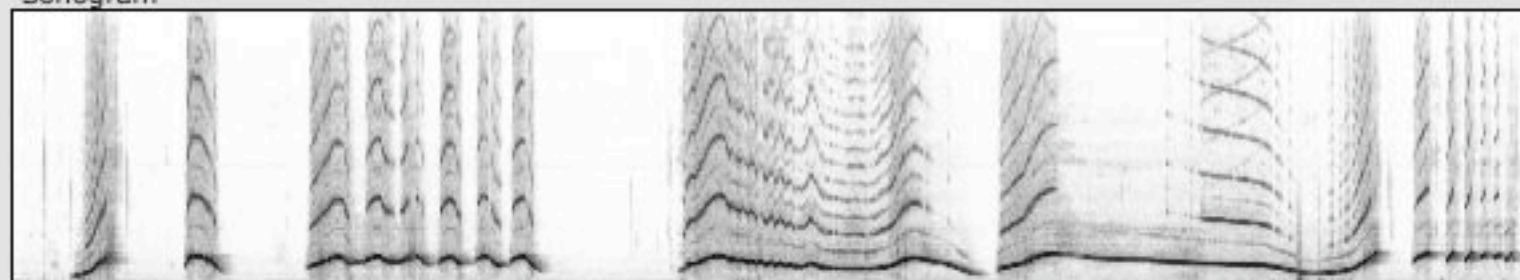
SoundAnalysis

Audio on Soundfile: Play
Mic/line in

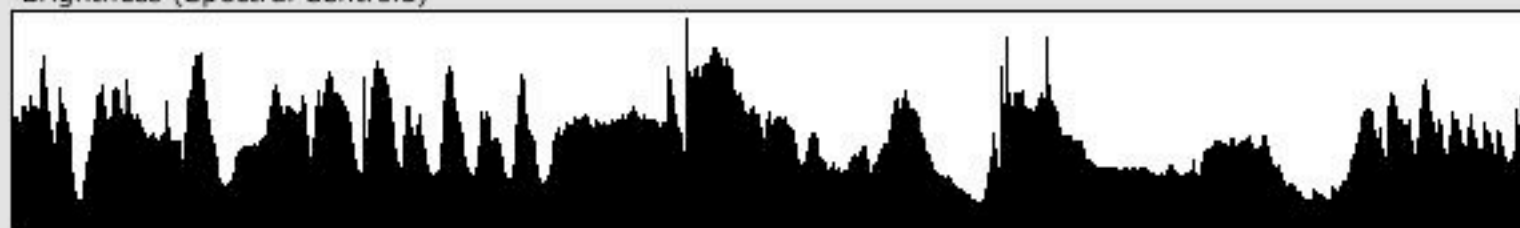


SoundAnalysis v0.3
fourMs, University of Oslo

Sonogram



Brightness (Spectral Centroid)



Loudness (Spectral Energy)



Noisiness (Spectral Flatness)



Pitch (F0) Estimation



Onsets



20k Hz

0

0 Hz

0

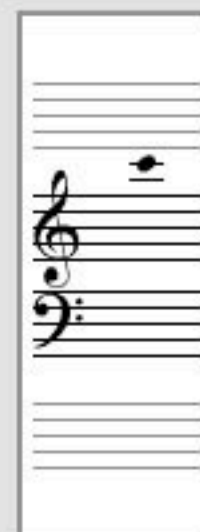
0 dB

0.1
noisy

0 Hz

0 dB

-120



0 Hz 10 KHz 22 KHz

Loudness
30 dB

Noisiness
1 noisy

0.8

0.6

0.4

0.2

0 peaky

-30 dB

-60 dB

-96 dB

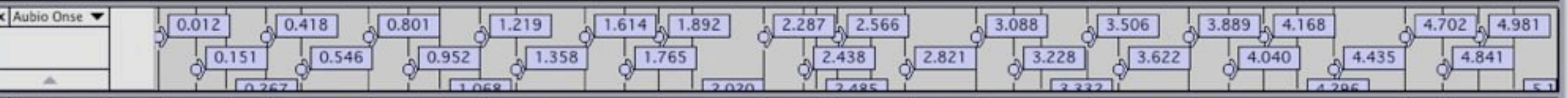
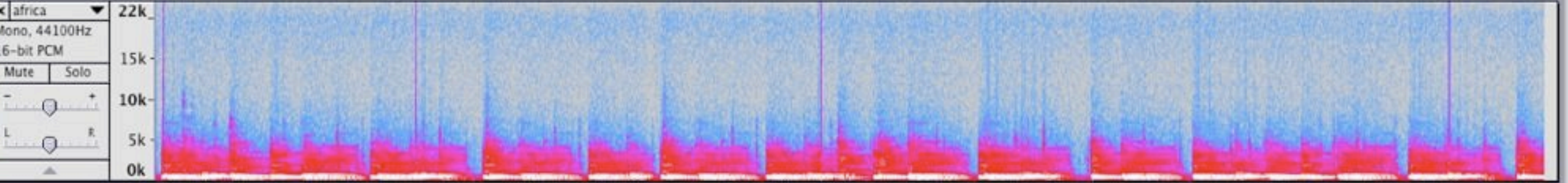
0 Hz 1 KHz 3 KHz 22 KHz

BARK auditory model spectrum

africa

Internal microphone

0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0



Annotasjon

Her skjer det noe

Her skjer det noe annet

Project Rate (Hz): 44100

Selection Start: 00 h 00 m 02 s

End: 00 h 00 m 02 s

Length: 00 h 00 m 00 s

Audio Position: 00 h 00 m 00 s

Snap To

Click and drag to select audio

Actual Rate: 44100



1 2 3

Colour Default

Scale Linear

Window 4096 93.75%

Bins Frequencies Log

Show Play



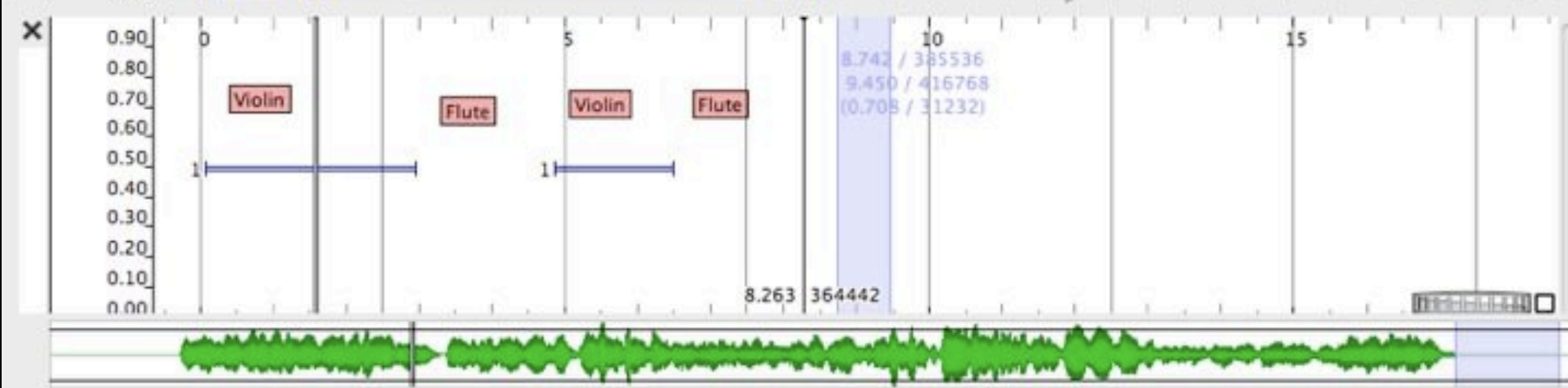
1 2 3

Colour Purple

Plot Type Cramp

Scale Auto-Align Hz

Show

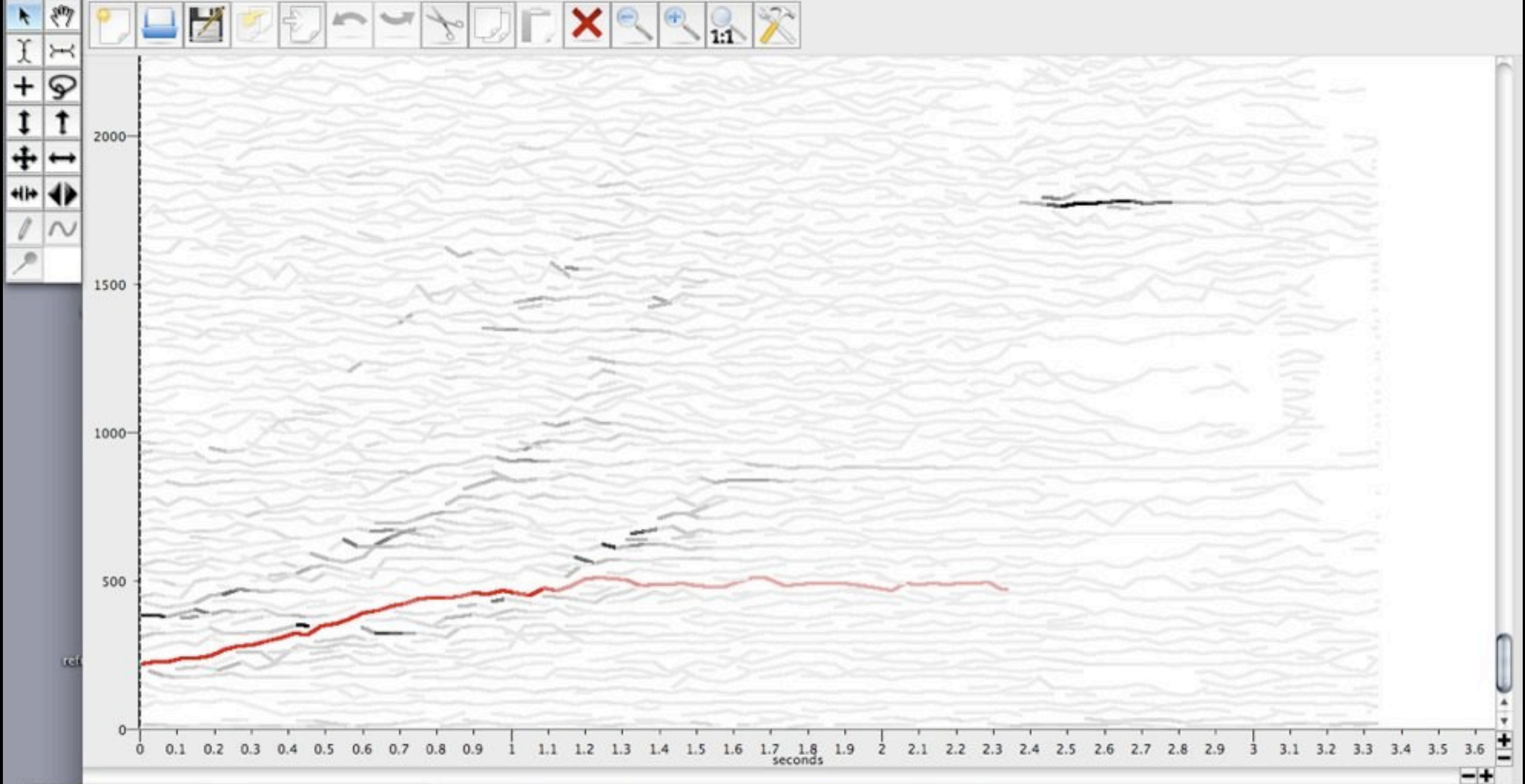


1 2 3 4 5

Colour Red

Show

Click and drag to select a range; hold Shift to avoid snapping to items; hold Ctrl for multi-select; middle-click and drag to navigate



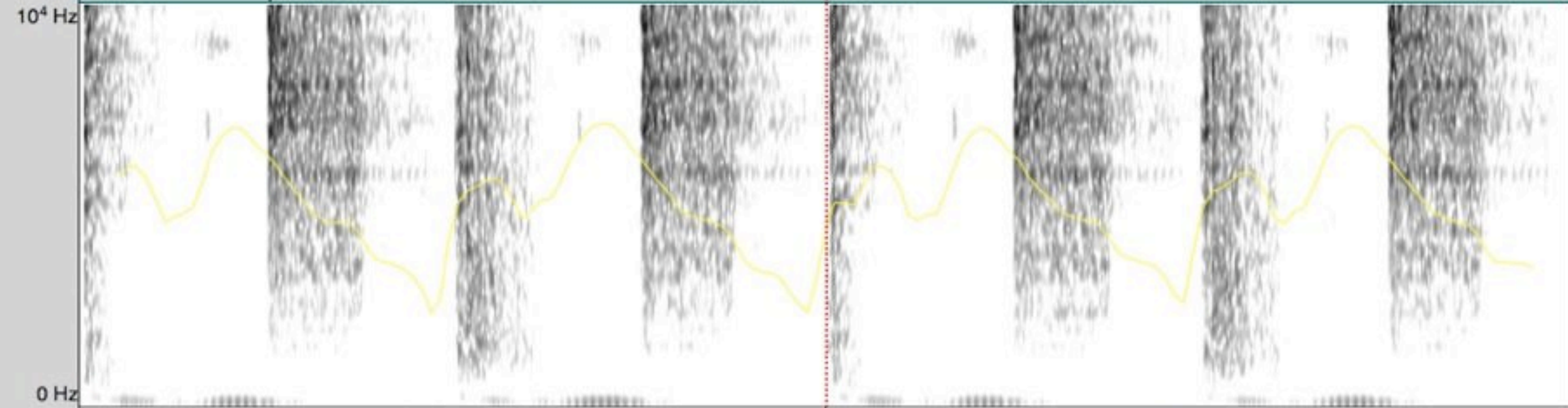
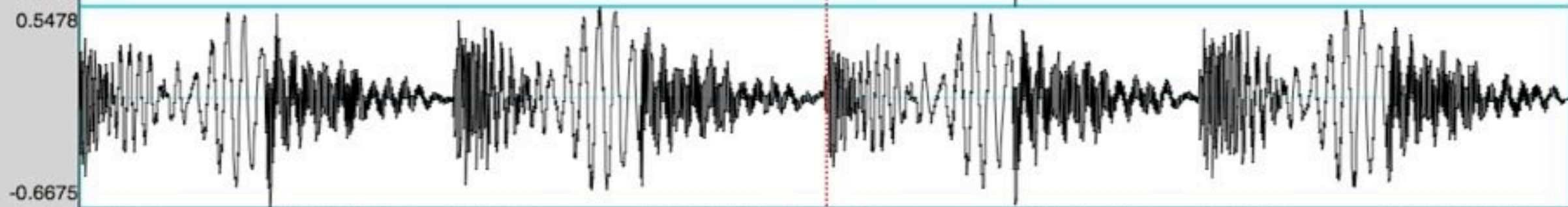
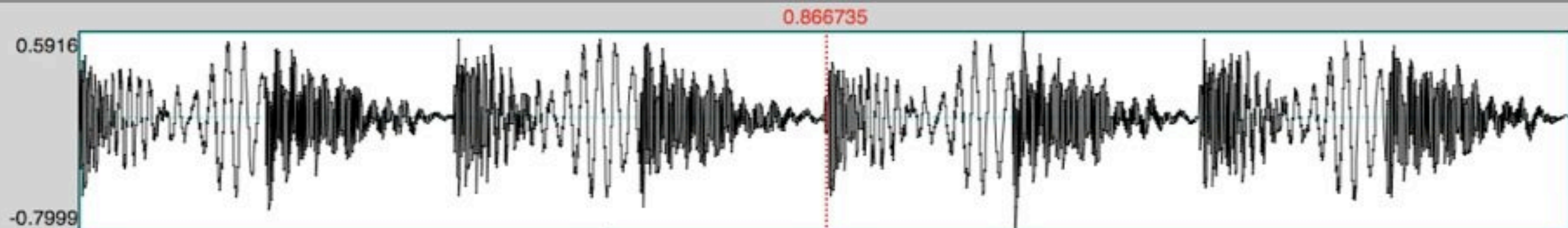
Cursor			
Time:	3.258 sec.	Frequency:	148.000 Hz
Keynumber:	50.137	Note:	D3

individual breakpoints. Hold down shift to extend the selection. Hit <space> to playback, <shift>-<space> to play selection.

5. LongSound Hardloop1

File Edit Query View Select Spectrum Pitch Intensity Formant Pulses

Help



100 dB

72.7 dB

50 dB

0.866735

0.866735

Visible part 1.733469 seconds

1.733469

Total duration 1.733469 seconds

all in out sel bak

Group

Pd

IN OUT

0 0

CLIP CLIP

compute audio

peak meters

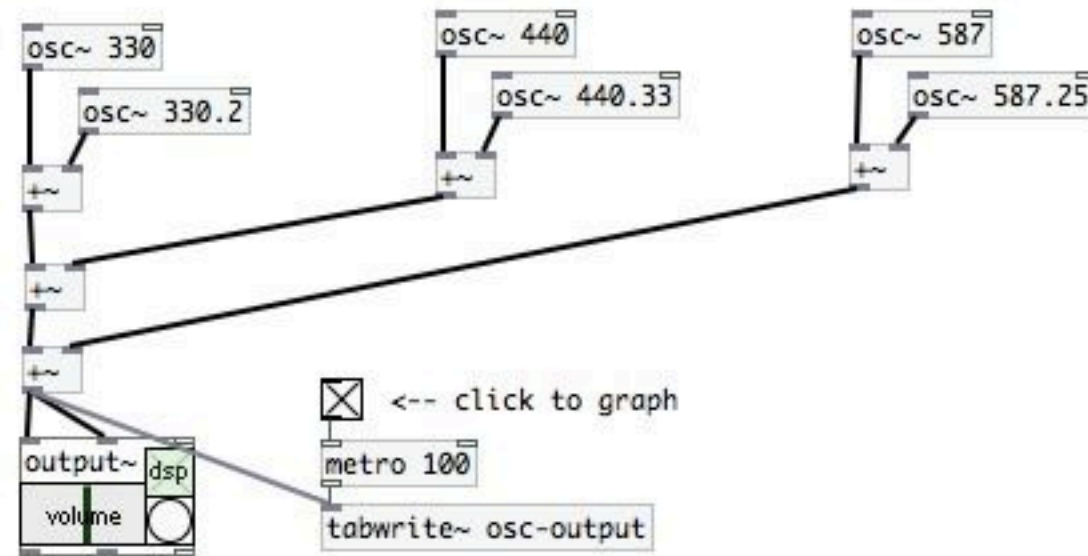
DIO

```

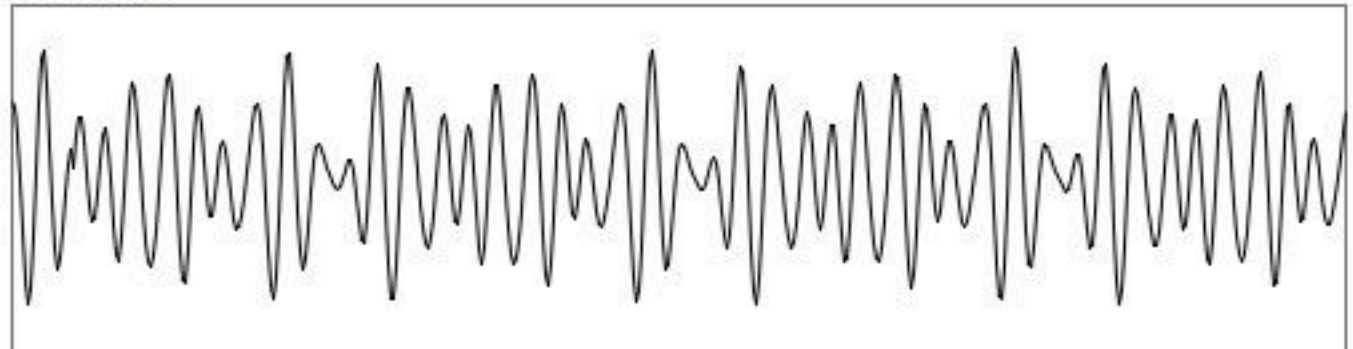
libdir_loader: added 'pixeltango' to the global
libdir_loader: added 'pmpd' to the global objec
libdir_loader: added 'rradical' to the global c
libdir_loader: added 'sigpack' to the global ob
libdir_loader: added 'smlib' to the global obje
libdir_loader: added 'toxy' to the global objec
libdir_loader: added 'unauthorized' to the glob
vbap - v1.0.3 - 12 Aug 2006 - (c) Ville Pulkki
libdir_loader: added 'pan' to the global object
libdir_loader: added 'freeverb' to the global c
libdir_loader: added 'hcs' to the global object
libdir_loader: added 'jmmmp' to the global obje
libdir_loader: added 'ext13' to the global obje
libdir_loader: added 'ggee' to the global objec
libdir_loader: added 'flib' to the global objec
libdir_loader: added 'ekext' to the global obje
libdir_loader: added 'flatspace' to the global
PDP: pure data packet version 0.12.5-darcs
PiDiP : additional video processing objects for
        version 0.12.23 ( ydegoyon@free.fr )
pdp_colorgrid: version 0.4
by Yves Degoyon (ydegoyon@free.fr) & Lluis Gome
saved to: /Users/alexanje/In progress/undervisr
saved to: /Users/alexanje/In progress/undervisr

```

beating.pd



osc-output




```
%% Read MoCap file
```

```
disp('Read a file and place it into  
m = mcread;  
tm=(0:(m.nFrames-1))/m.freq;
```

```
% Read audio file in Matlab
```

```
[file,path] = uigetfile({'*.wav'},  
fn = [path file];  
[x,fs]=wavread(fn);  
x=x(:,1); % Reduce  
ms1=fs/1000; % maxi  
ms20=fs/50; % mini  
t=(0:length(x)-1)/fs; % time  
xd=(length(x)-1)/fs; % dur
```

```
tmin=100;  
tmax=1000;
```

```
txmin=tmin*fs/m.freq;  
txmax=tmax*fs/m.freq;
```

```
% Read audio file in MIRToolbox  
a=miraudio(fn,'Extract',tmin/100,tx
```

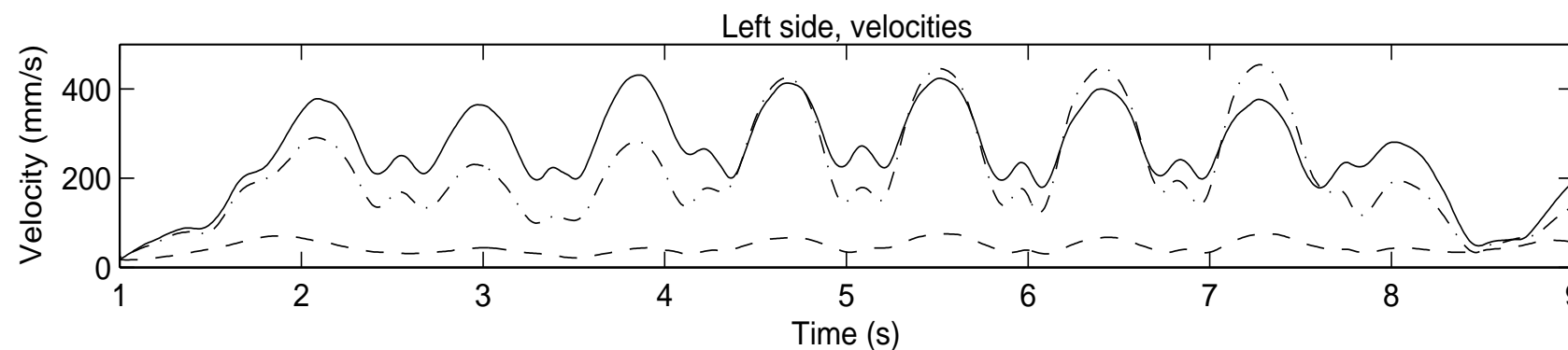
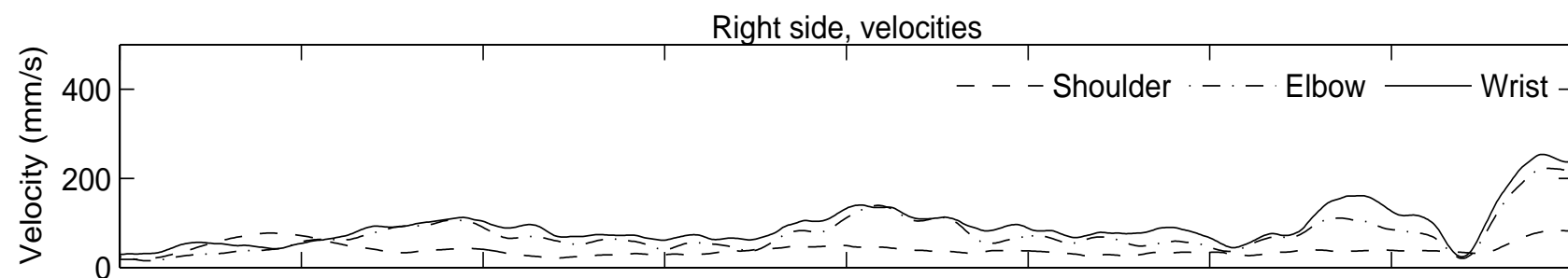
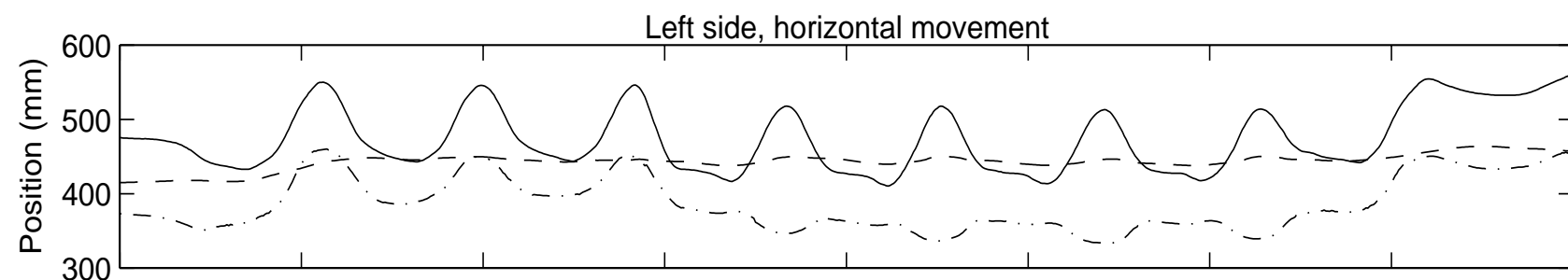
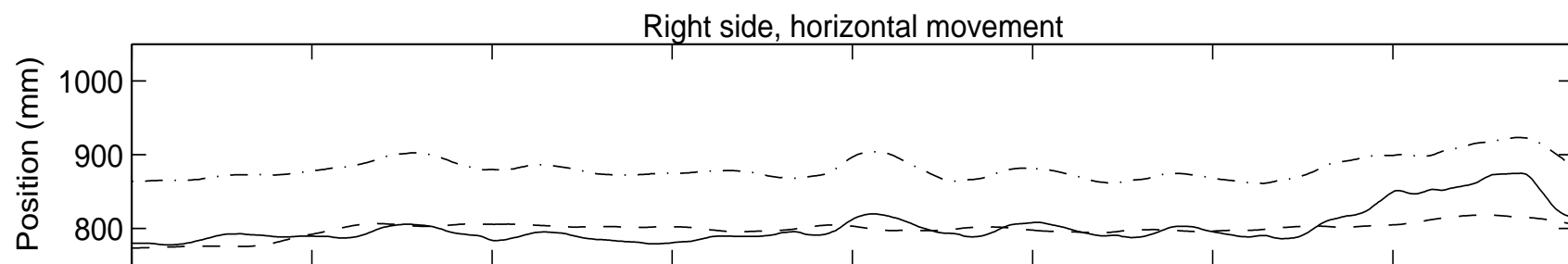
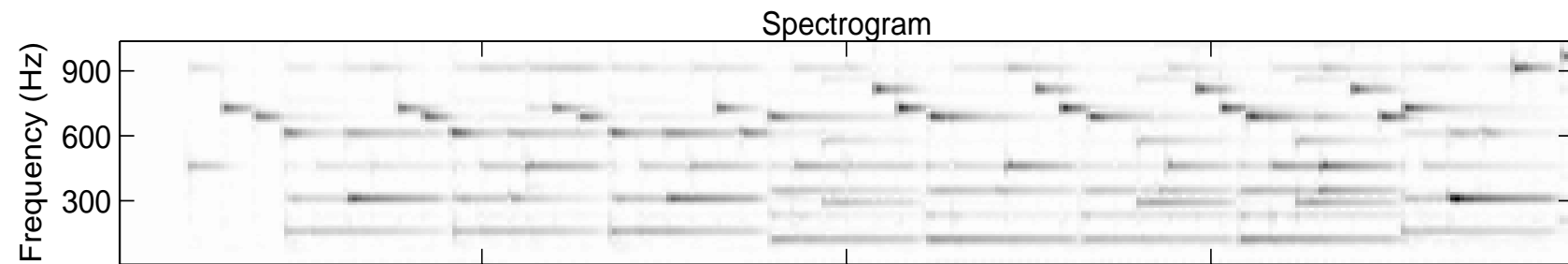
```
%% Basic conversions
```

```
disp('First derivative (velocity)')  
d2v=mctimer(m, 1);
```

```
disp('Second derivative (accelerati  
d2a=mctimer(m, 2);
```

```
disp('Component parts of the above  
mn=mcnorm(m);  
d2vn=mcnorm(d2v);  
d2an=mcnorm(d2a);
```

```
disp('Smoothen data')  
mns=mcsmoother(mn);  
d2vns=mcsmoother(d2vn, 99);  
d2ans=mcsmoother(d2an, 99);
```



Til neste gang

Les Collins 1-3

Installer programvare

Ta med datamaskin

Ta med lyd (AIFF/WAV)