



Introduction to Visual Signal

AnCAD, Inc.

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Outline

- Examples

- 誰在抽水?
- 可以預測地震嗎?
- 有幾種青蛙?

- Visual Signal – 分析工具

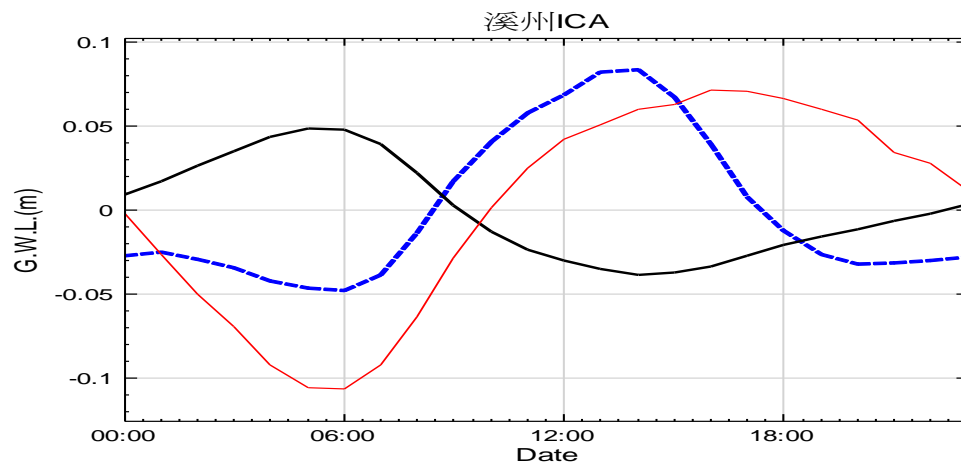
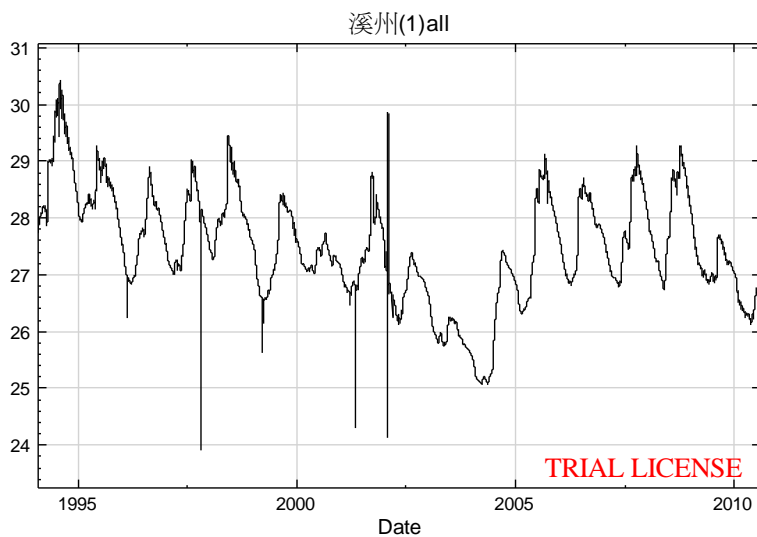
- 介面: 圖形化元件, 圖形化流程
- 模組: 補遺, 頻譜, 時頻圖, 趨勢, 抓取極值, 批次處理



Visual Signal

誰在抽水？

- 將不同型態的抽水所造成之水位洩降分離。

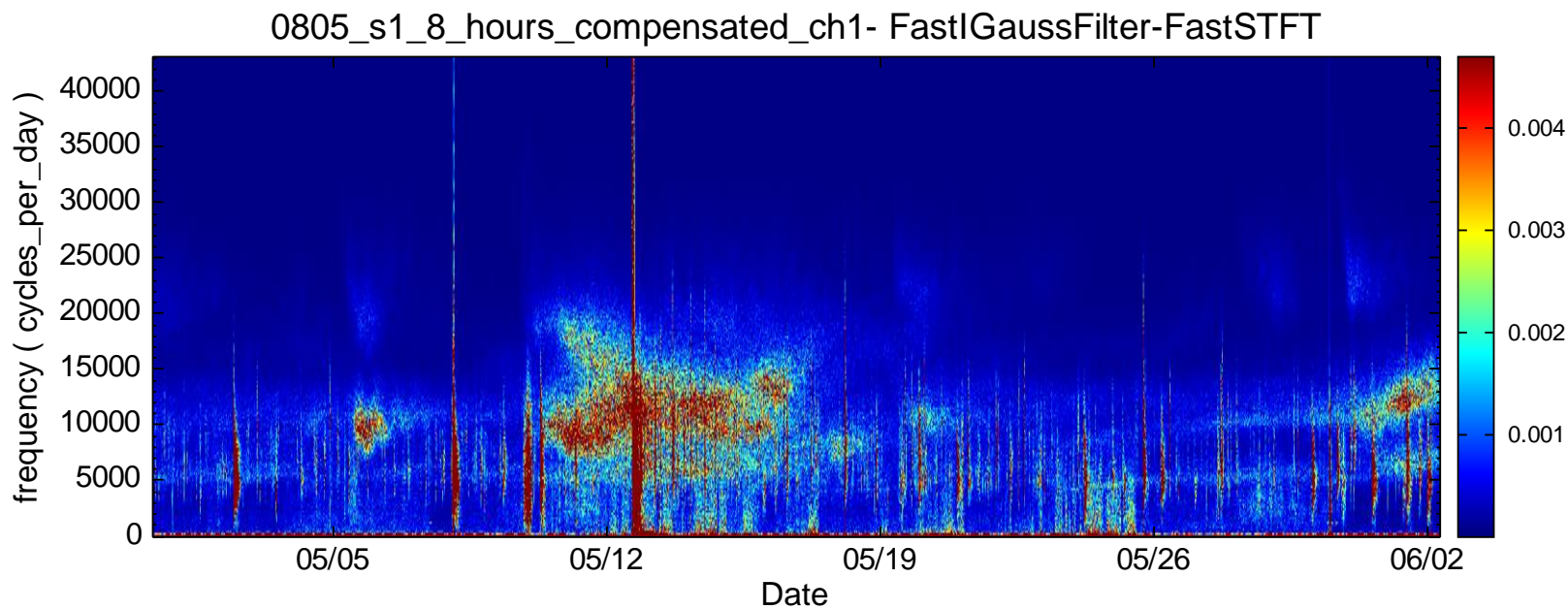
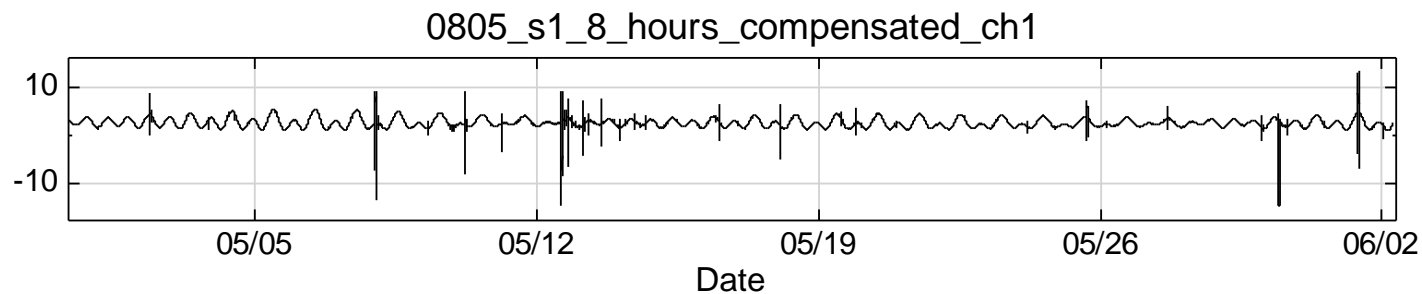


Visual Signal

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可以預測地震嗎？

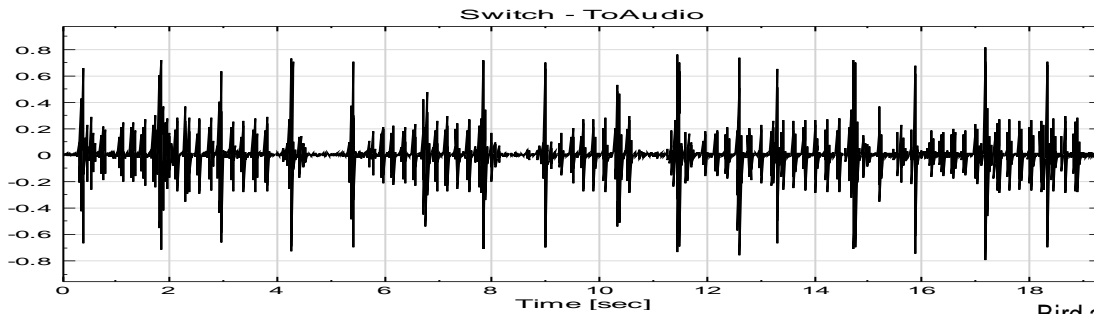


Visual Signal

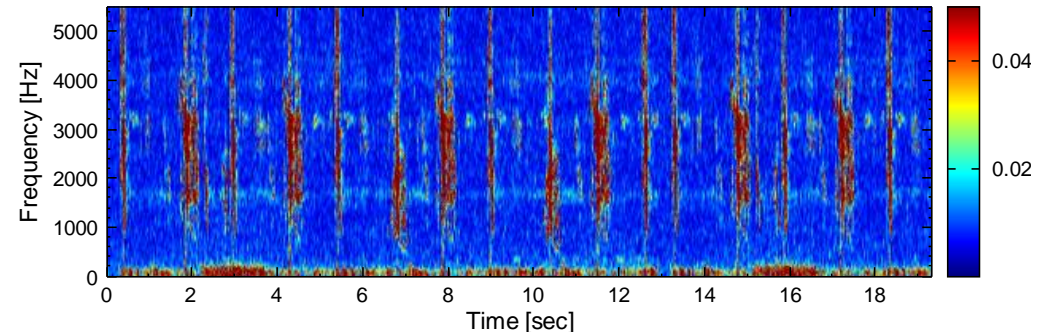
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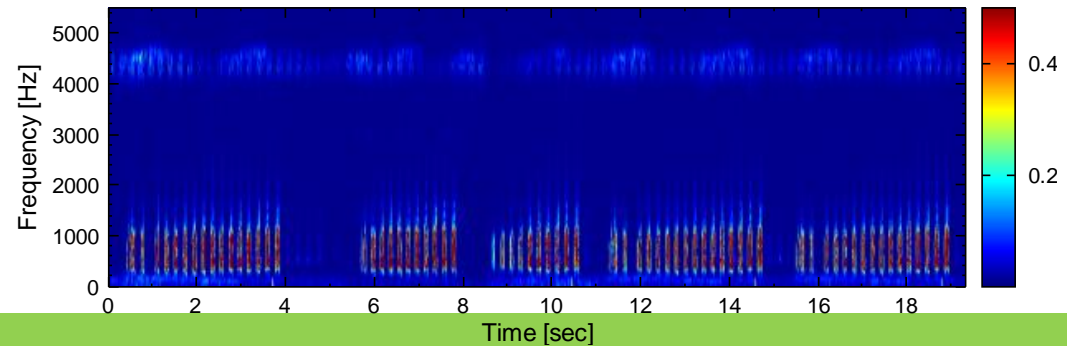
有幾隻青蛙?



Bird and Frog - ICA_Ch1:CH1-FastSTFT



Bird and Frog - ICA_Ch2:CH2-FastSTFT



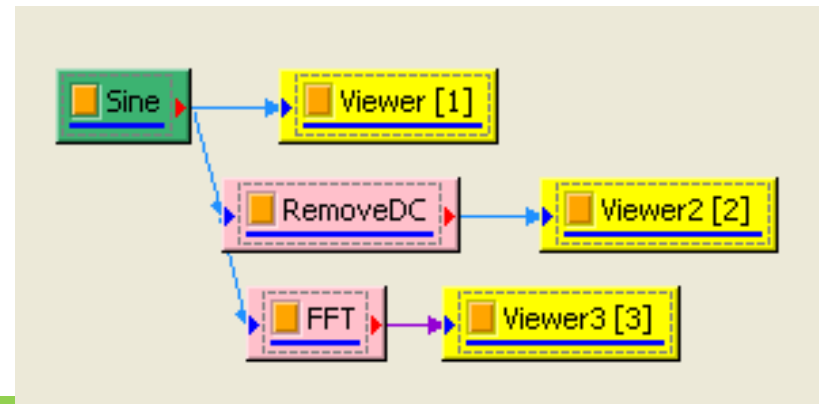
Visual Signal

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Visual Signal 訊號分析軟體

- 訊號分析專門軟體
- 處理包含日期的時間序列
- 視覺化的程式撰寫流程
- 可結合Matlab與C#



Visual Signal

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視覺化程式撰寫

- 使用各類型的**圖形元件**來代表訊號處理過程的每個工作
- 以具有**方向性**的連接線來建立元件間的關係
- 連接的網路關係代表著訊號處理的**資料流**
(Data Flow)

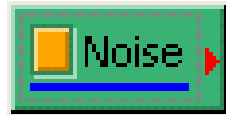


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圖形元件種類



綠色元件

Source: 提供或輸入不同的訊號源。



粉紅色元件

Compute: 提供訊號處理與運算



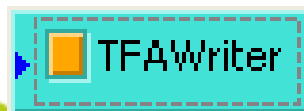
褐色元件

Conversion: 訊號格式的轉換



黃色元件

Viewer: 針對不同運算提供相對應的繪圖展示



藍色元件 Writer: 運算結果的輸出



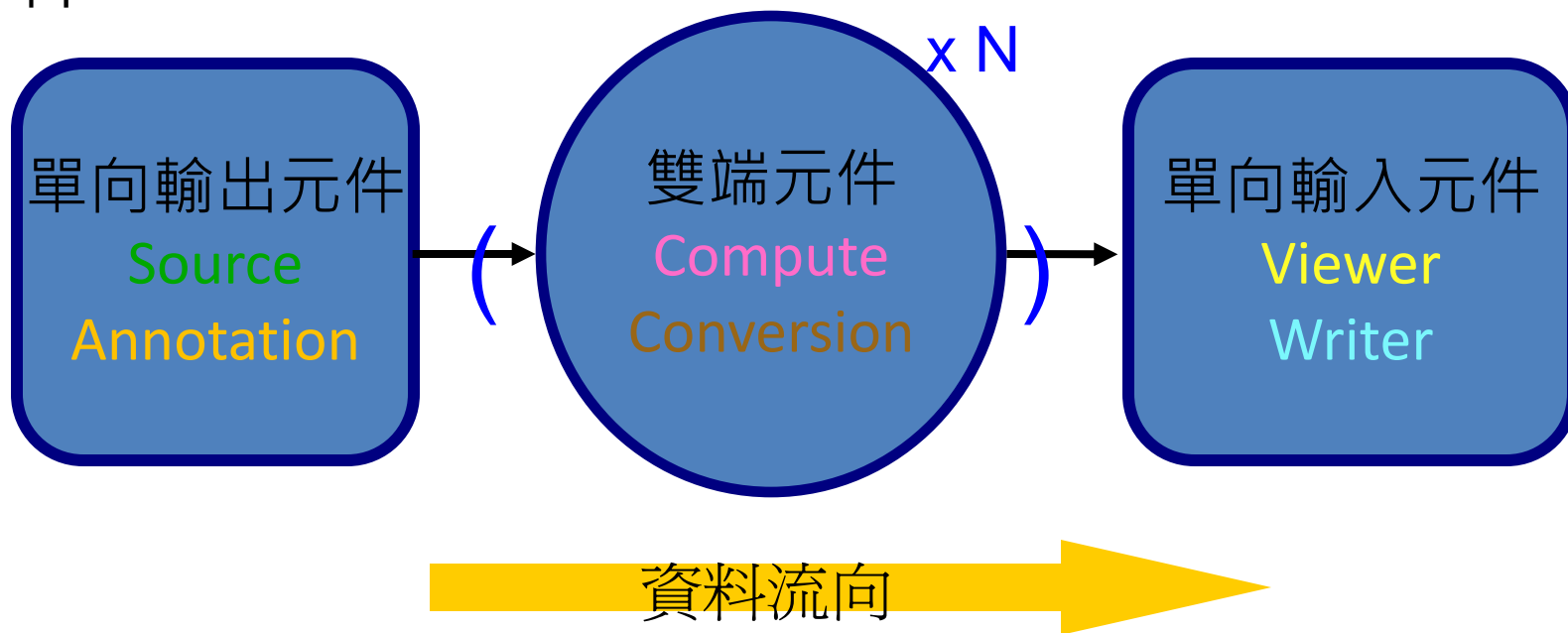
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資料流

- 始於單向輸出的元件，止於單向輸入的元件



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資料格式

- 支援多種資料格式
 - Matlab *.mat
 - 地震訊號 *.sac
 - 文字檔案 *.txt, *.csv
 - 聲音檔案 *.wav, *.mp3
 - VS檔案 *.tfa, *.vsb
 - 圖片檔 *.jpg, *.bmp, *.png, *.tif, *.wmf



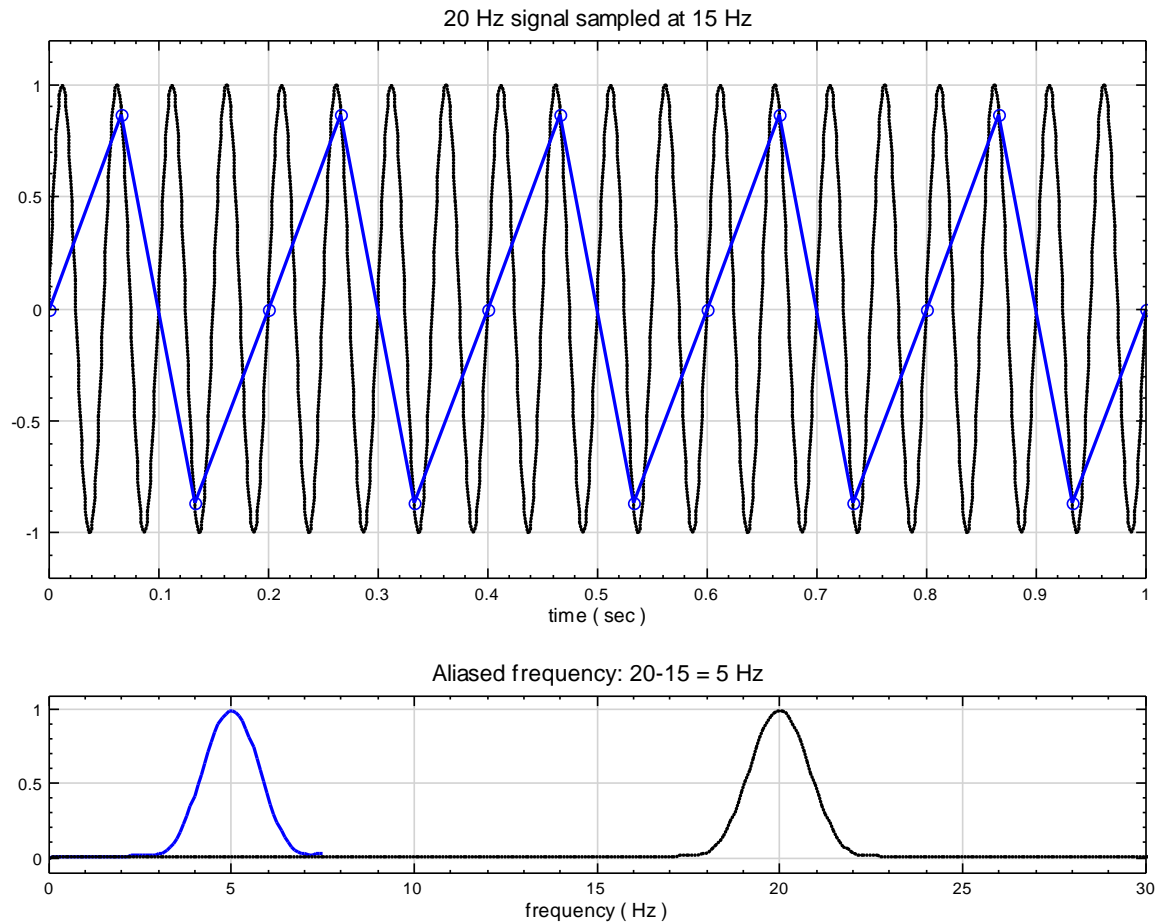
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繪圖類型

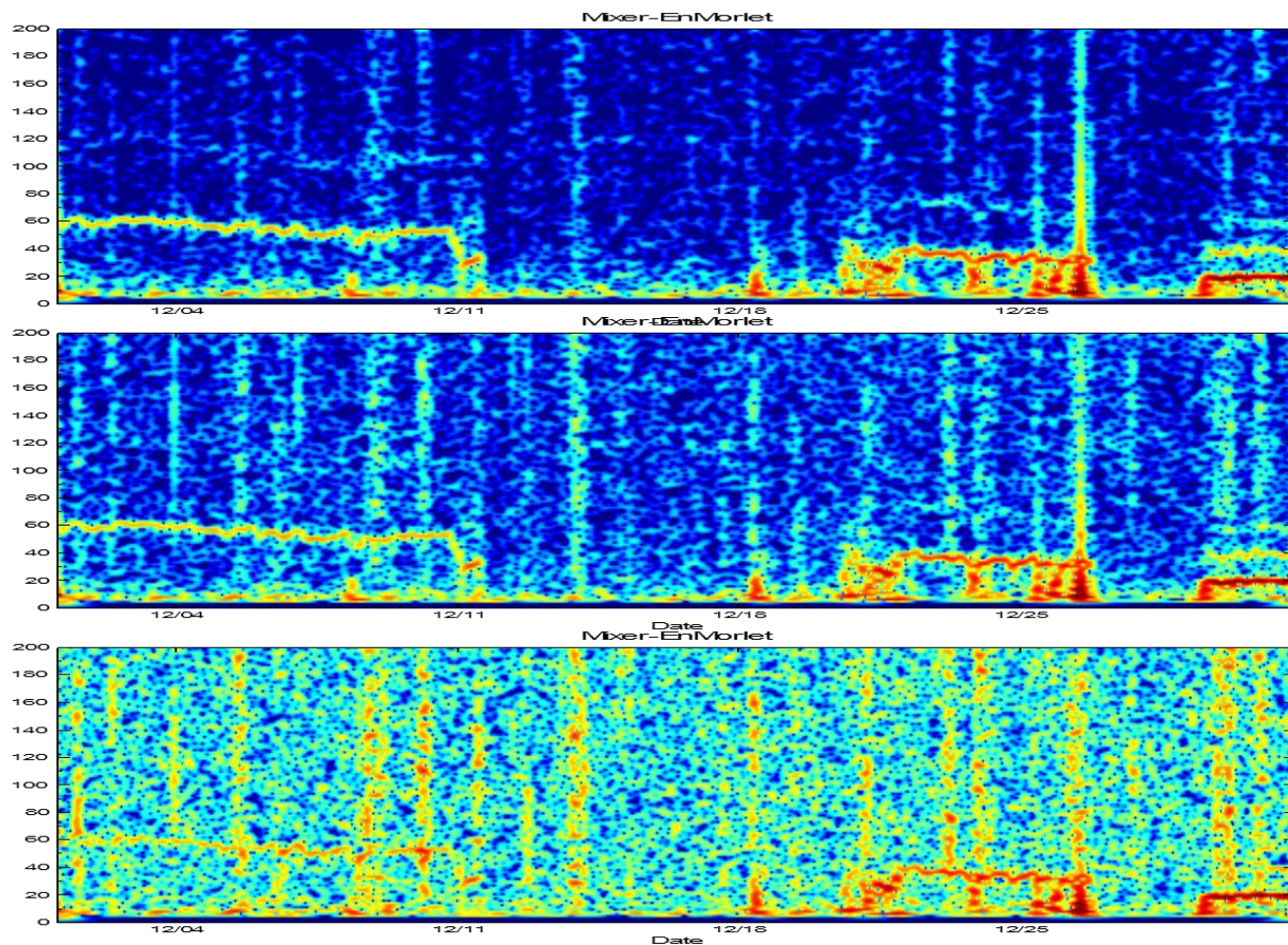
- time plot,
freq. plot,
X-Y plot



Visual Signal

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- TFA plot

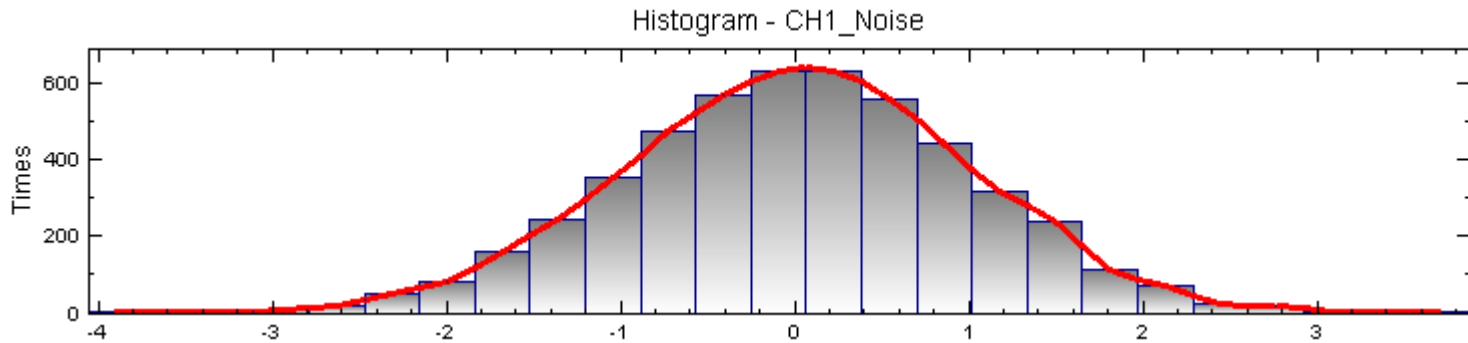


Visual Signal

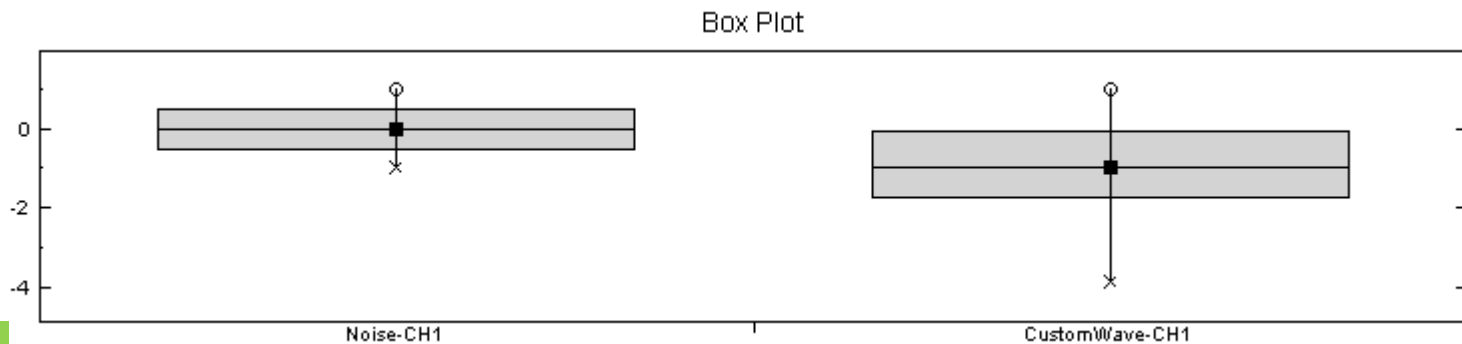
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- Histogram



- Box plot





Project1

Visualization Window

繪圖視窗

Pull-Down Menu

下拉選單

Network Window

元件操作視窗

None Selected.

Auto



Properties

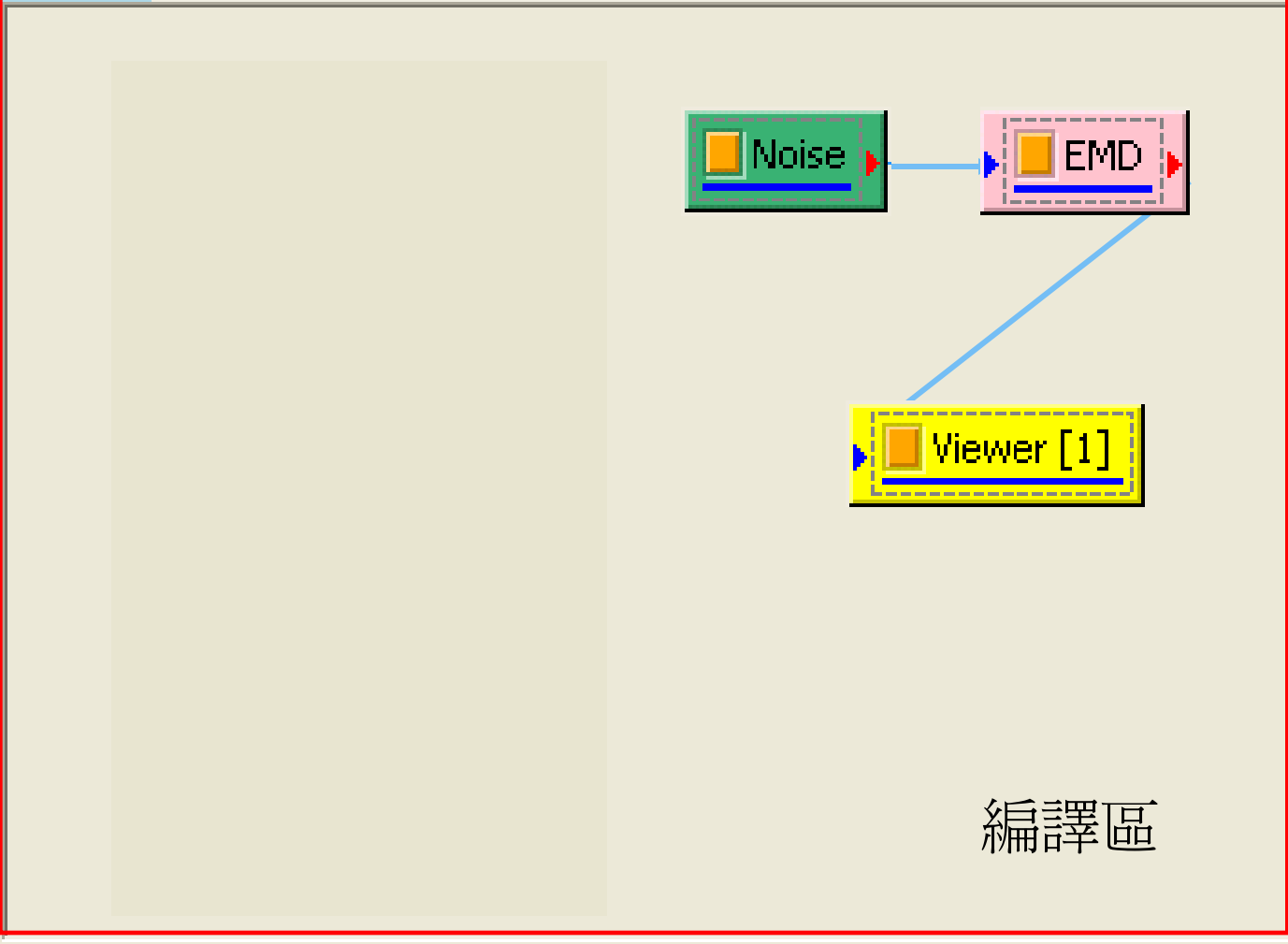
Property Window

參數設定視窗



工具列

Project1



編譯區

None Selected.

運算控制區

Auto





Project1

Visualization Window

繪圖視窗

Pull-Down Menu

下拉選單

Network Window

元件操作視窗

None Selected.

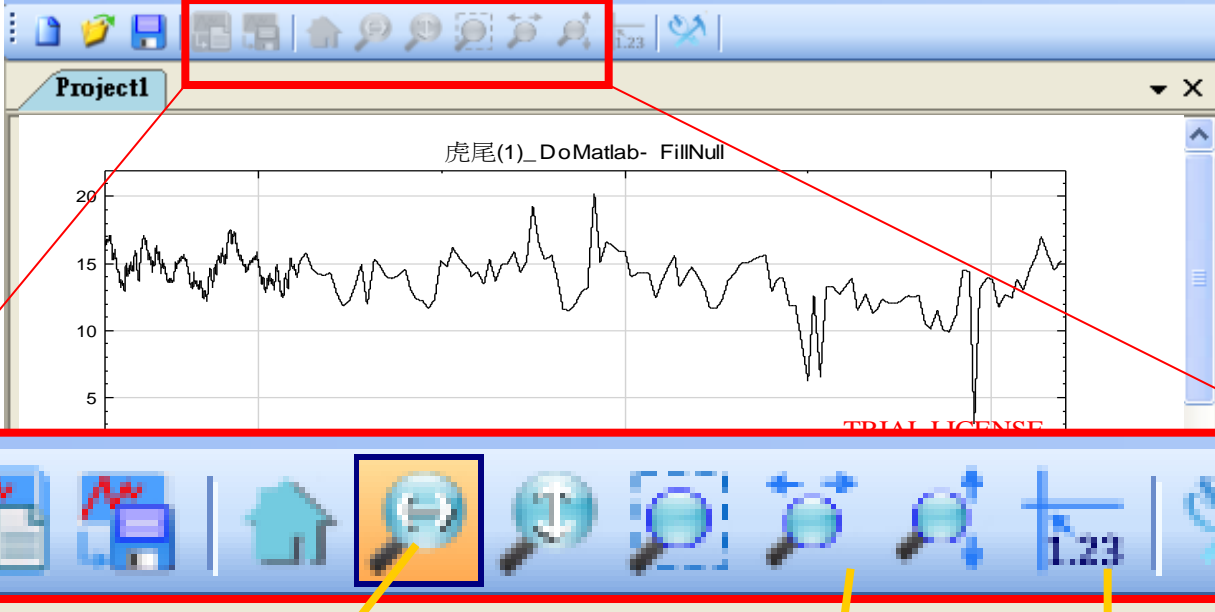
Auto



Properties

Property Window

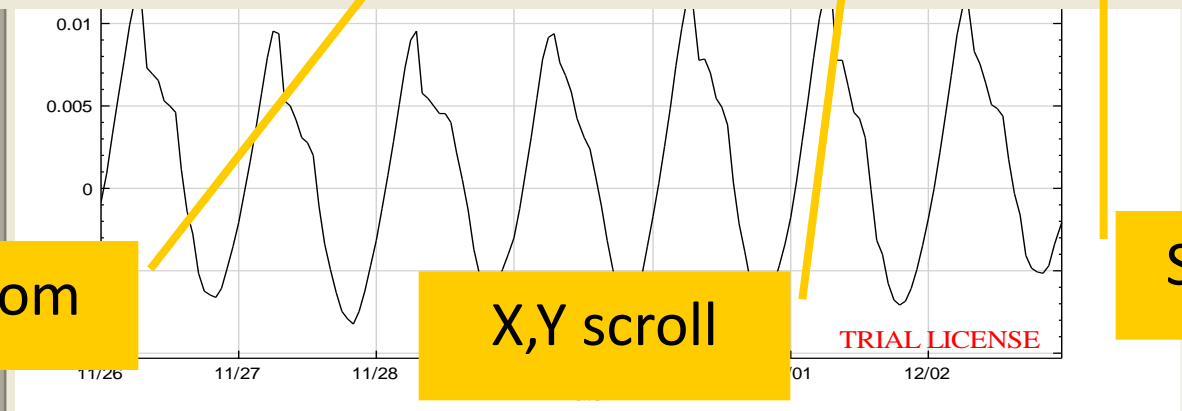
參數設定視窗



X, Y zoom

X,Y scroll

Show Value





Project1

Visualization Window

繪圖視窗

Pull-Down Menu

下拉選單

Network Window

元件操作視窗

None Selected.

Auto



Properties

Property Window

參數設定視窗

Property

Appearance	
BackColor	<input type="checkbox"/> White
ViewerWidth	default (750)
ViewerHeight	default (180)
ListOrder	1
RetainPlot	False
Channel	
Channel Count	0
Fonts and Colors	
Grid	
Module	
Representation	
TimeUnit	
LegendPosition	None
AutoLegendNames	True
DrawStyle	Line
XAxisType	LinearAxis
Plot Elem Editor	PlotEditor
DataValueType	Magnitude
Hold Plot Range	False

DataValueType
If data is complex, select a data representation type: Magnitude, Phase, RealPart, ImagPart, Gain, PowerSpectrum.

灰色表示不能修改

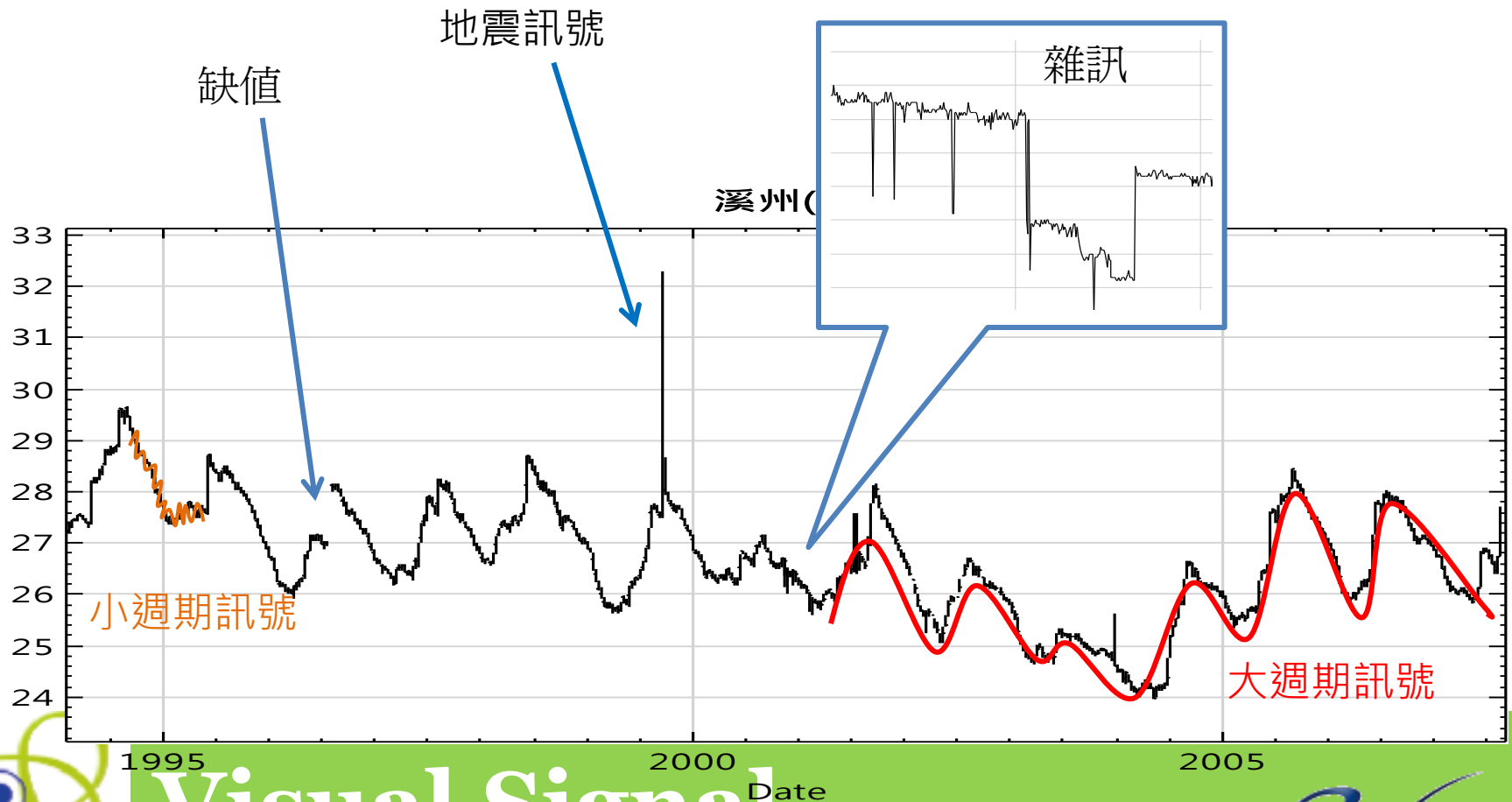
default
auto
輸入數值
True/False
選項

每個參數的說明



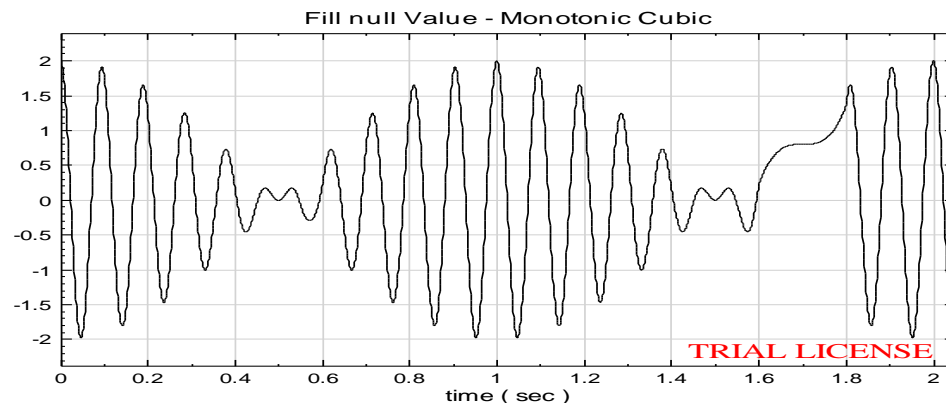
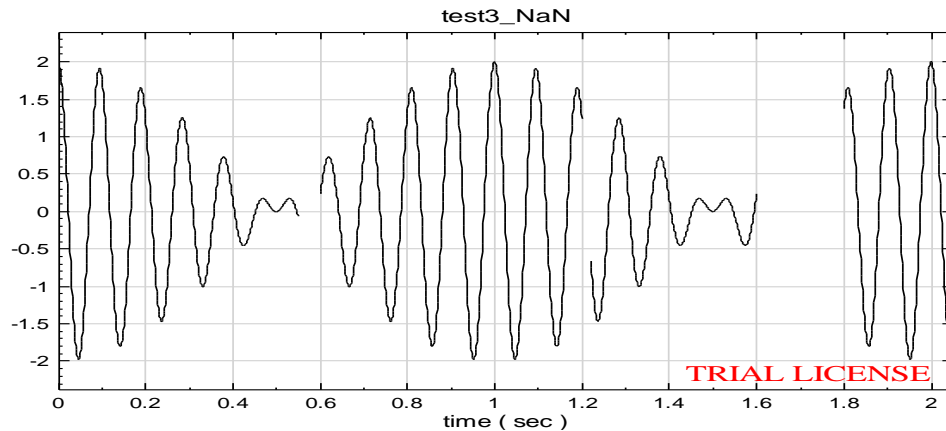
Visual Signal

A typical groundwater level signal



Visual Signal

Fill Null Value 補遺

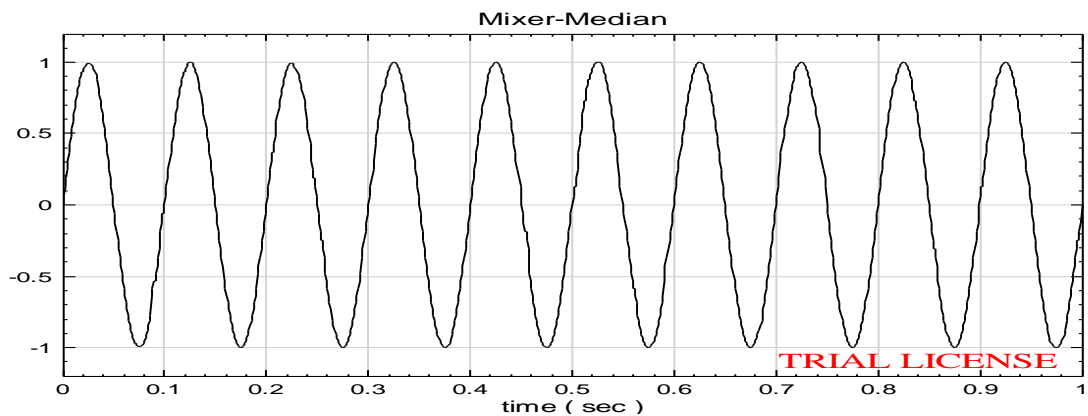
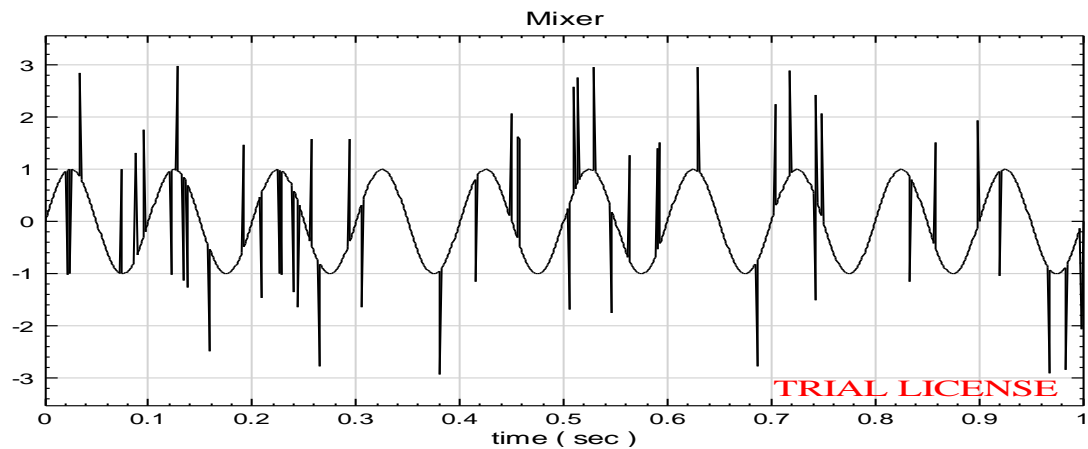


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Median filter 除噪

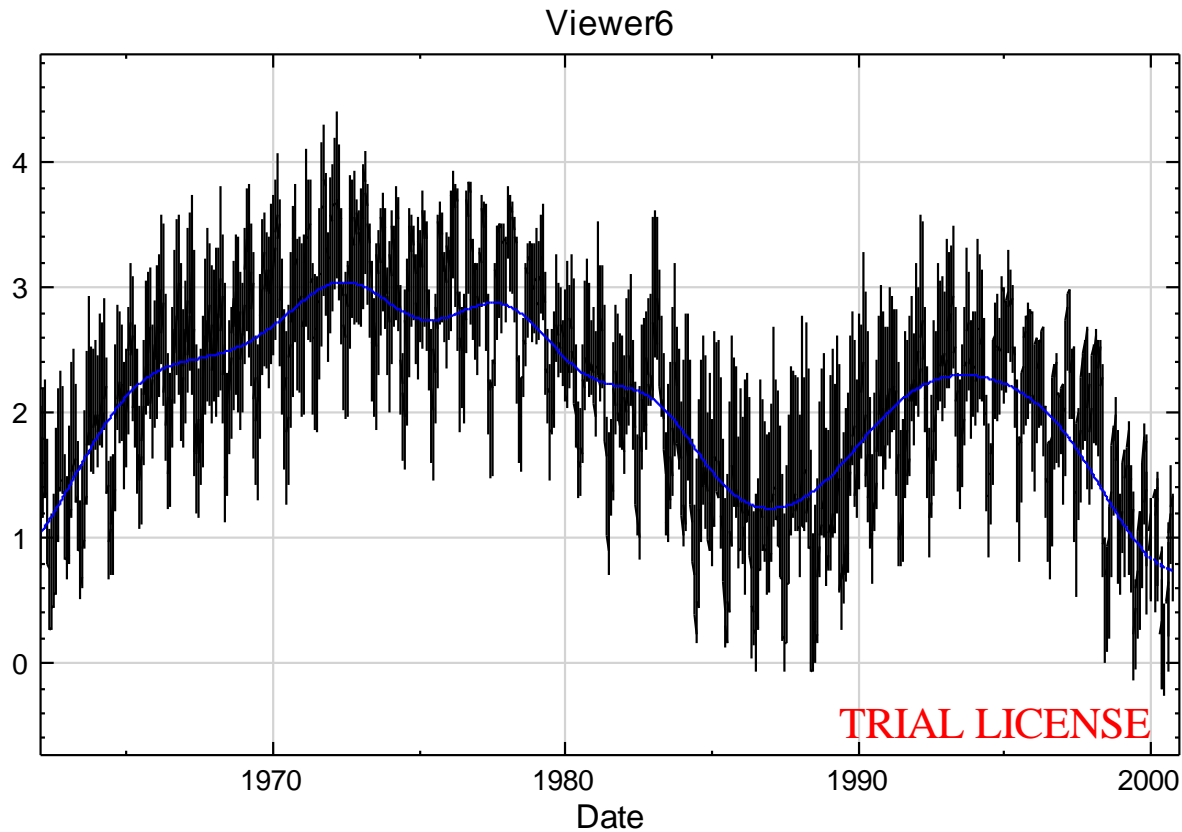


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Trend Estimator 趨勢

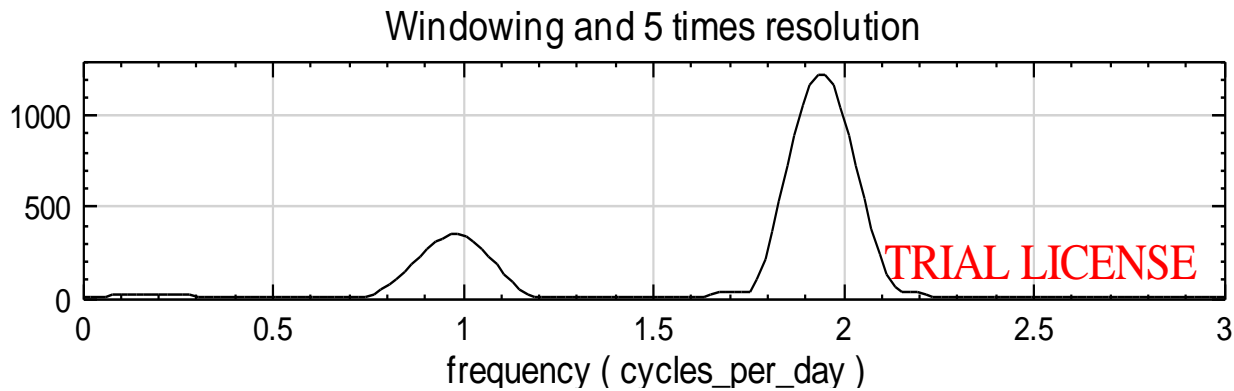
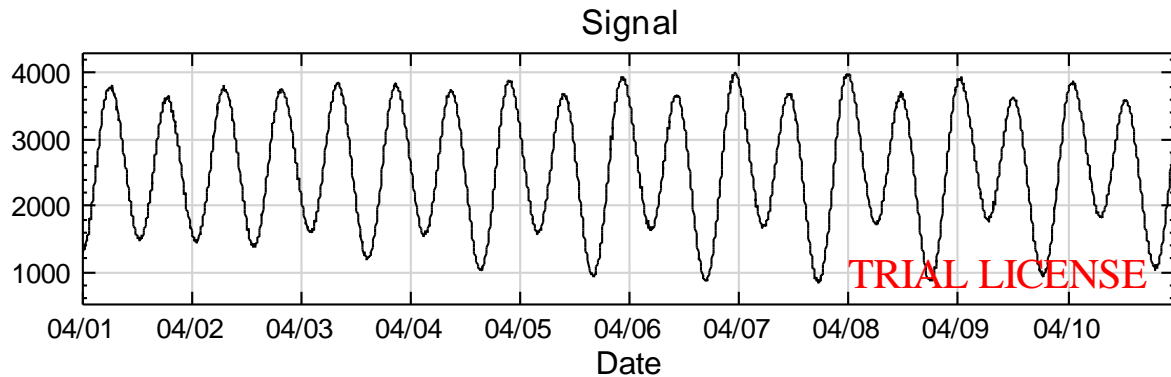


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Fourier Transform

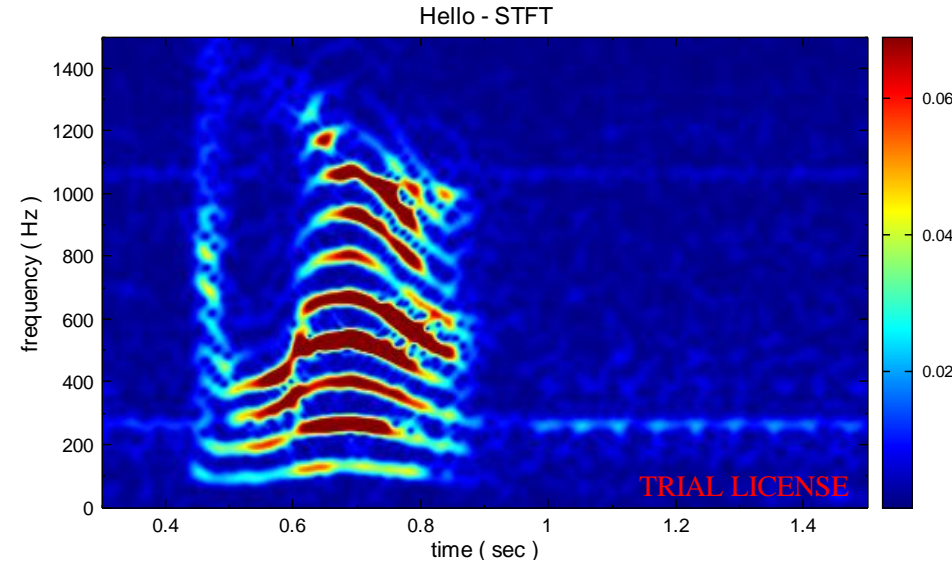
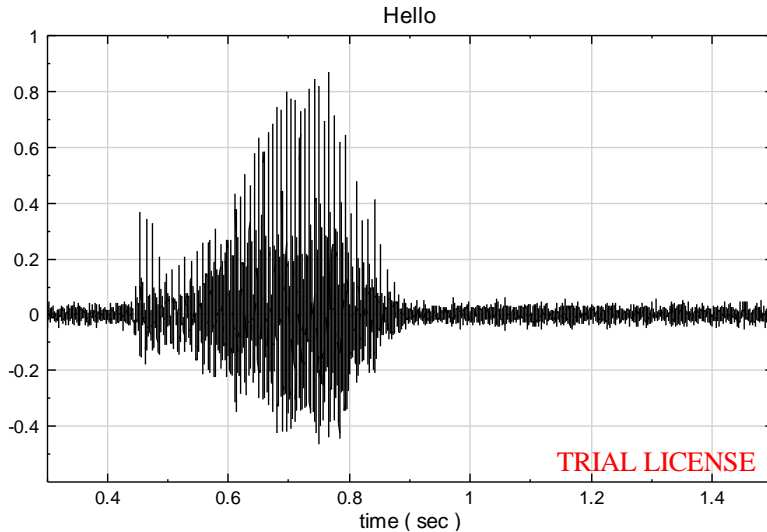


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Short-term Fourier Transform

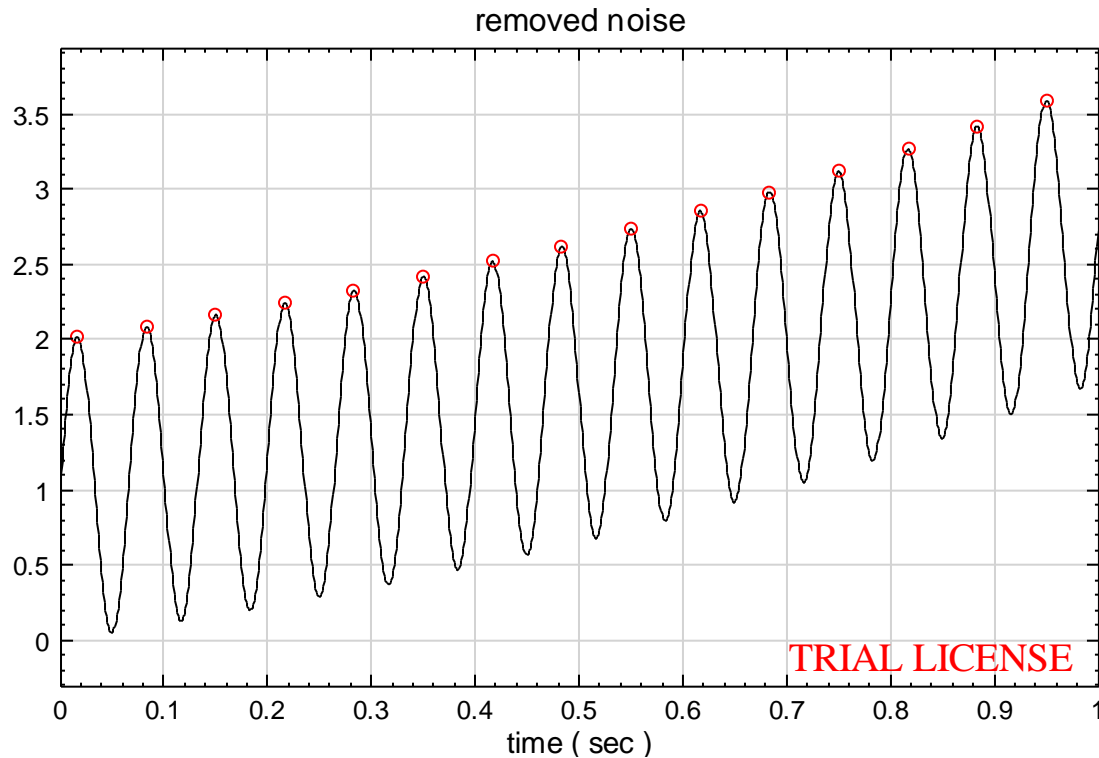


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Peak Detection 抓取極值

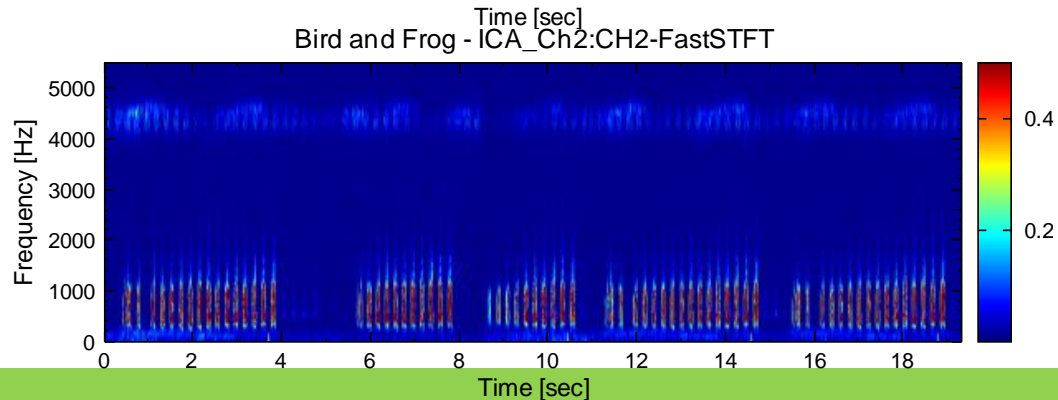
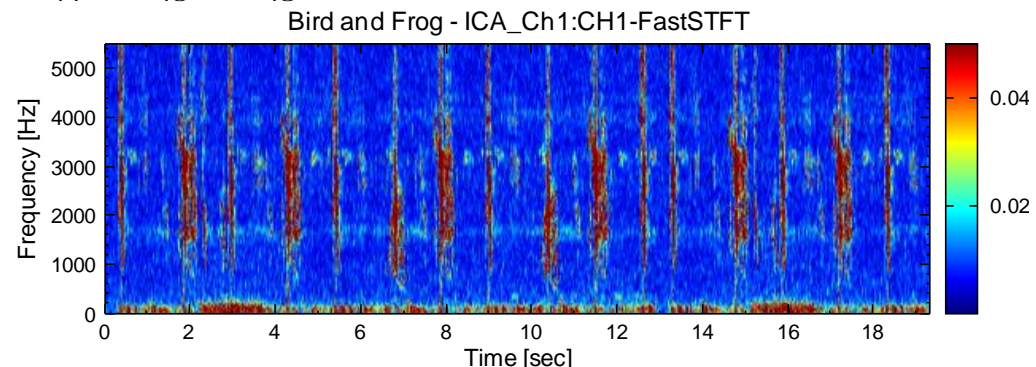
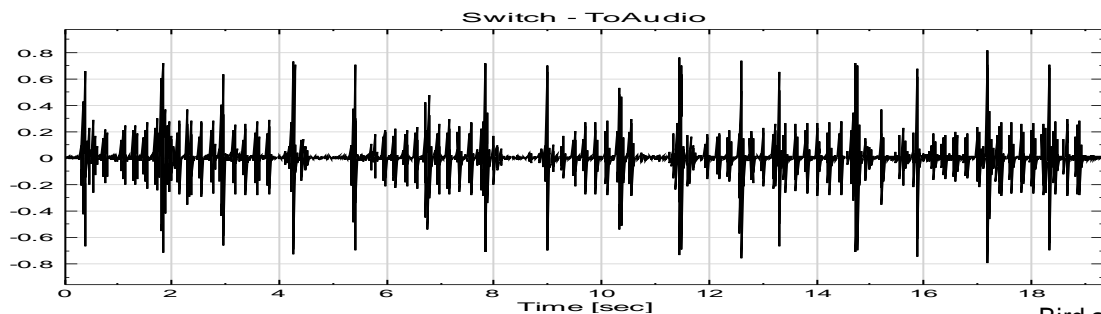


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ICA 獨立成分分析法

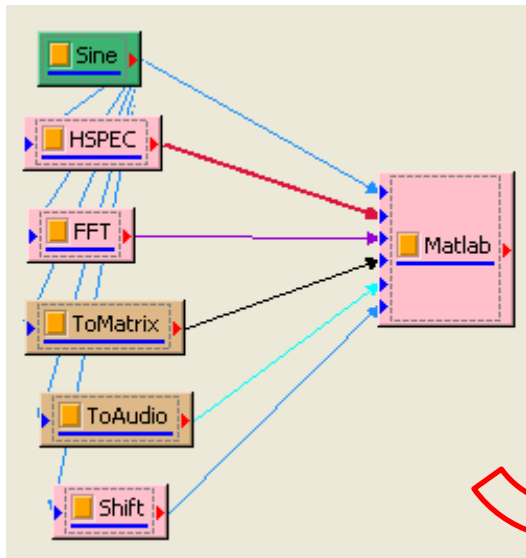


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DoMatlab 與MATLAB連接介面



MATLAB Command Window

```
>> whos
```

Name	Size	Bytes	Class	Attributes
X	1001x1	8008	double	
X1	1001x1	8008	double	
X1_DATA	1x1	8068	cell	
X1_DESC	1x1	9322	struct	
X1_FREQ	1x1	8	double	
X2	1001x256	2050048	double	
X2_DATA	1x1	2050108	cell	
X2_DESC	1x1	17288	struct	
X2_FREQ	1x1	8	double	
X3	501x1	8016	double	complex
X3_DATA	1x1	8076	cell	
X3_DESC	1x1	5328	struct	
X3_FREQ	1x1	8	double	
X4	1001x1	8008	double	
X4_DATA	1x1	8068	cell	
X4_DESC	1x1	17422	struct	
X4_FREQ	1x1	8	double	
X5	1001x1	8008	double	
X5_DATA	1x1	8068	cell	
X5_DESC	1x1	9340	struct	
X5_FREQ	1x1	8	double	
Y	1001x1	8008	double	
Y_DESC	1x1	9080	struct	

輸入訊號依照輸入順序存放在名為 X1_DATA、X2_DATA、X3_DATA... 的cell arrays。

第m個輸入Xm_DATA 中的第n個通道表示法為Xm_DATA {n}。

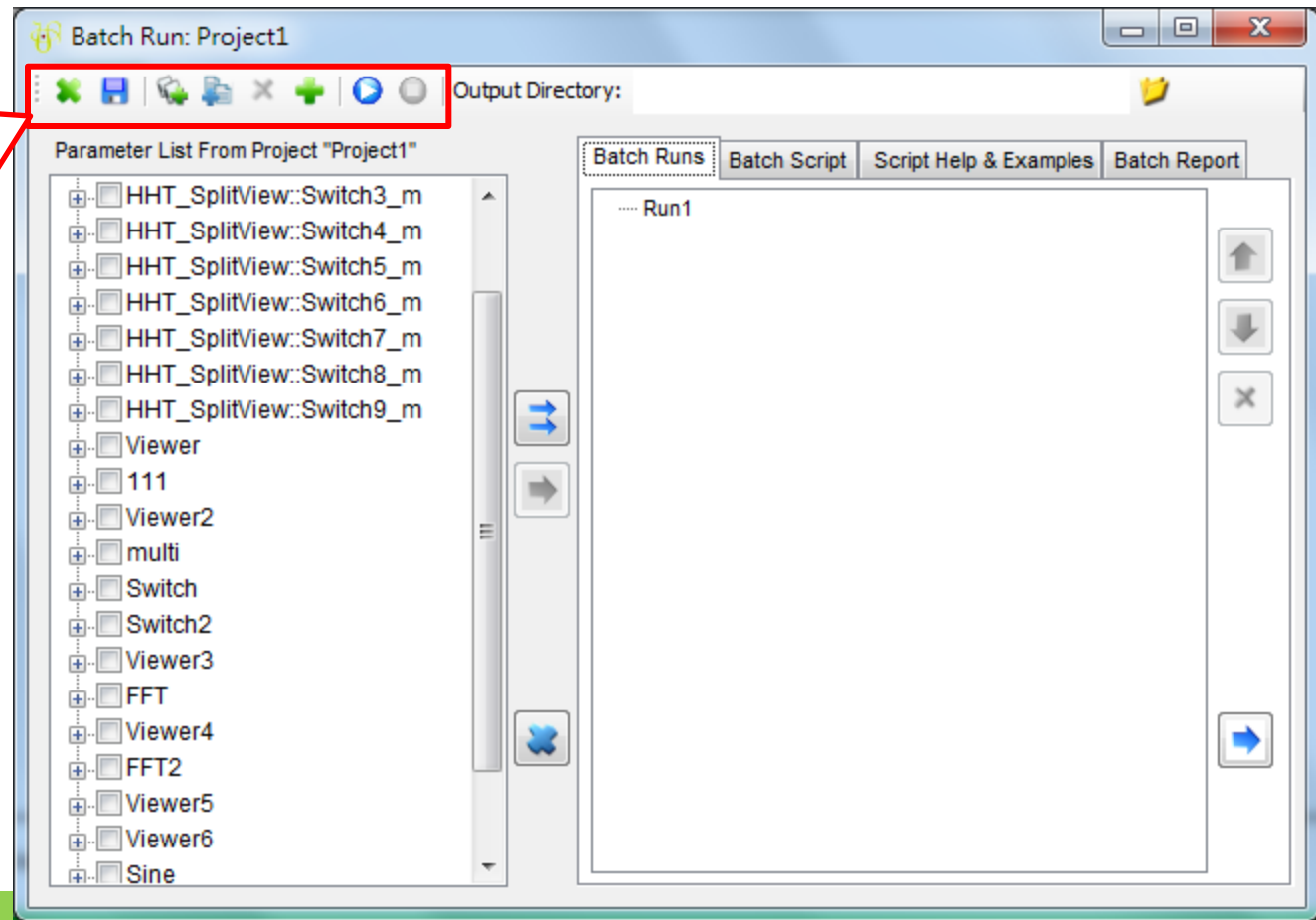
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Batch 批次處理

- ① 清除
- ② 儲存 Batch 內容
- ③ 增加批次作業
- ④ 選取多筆資料檔
- ⑤ 刪除已存在的 Run
- ⑥ 打開參數欄位
- ⑦ 執行Batch
- ⑧ 中斷正在執行的 Batch



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THANK YOU!!



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