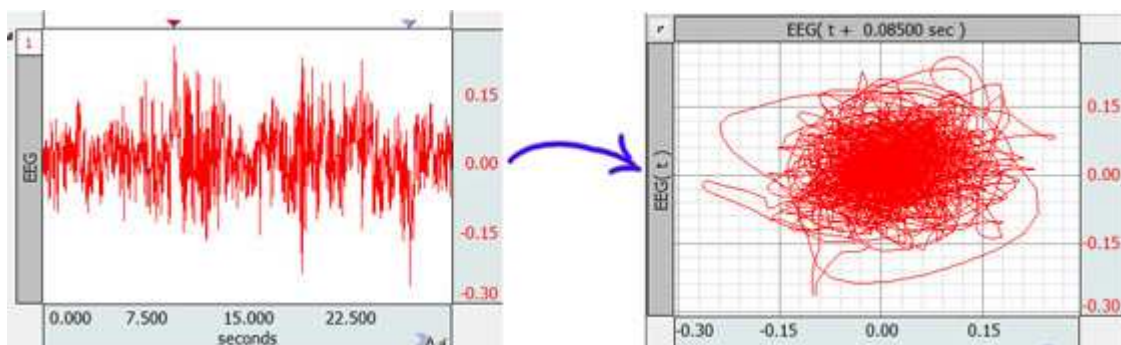


AcqKnowledge tools: Sleep deprivation and EEG chaos

AcqKnowledge 5 has a large library of analysis routines for many different interesting applications that BIOPAC has added over the years. Many users are not aware of all the features available. Maybe you simply collect data and do not search in all menus? Or maybe you have an old version of the program that lacks some features? Instead of telling you about everything you can do, we have chosen an exciting example that we want to share with you:

Time series data from an EEG signal can appear unpredictably chaotic. One method of attempting to characterize such systems without exact models of underlying mechanisms is to try to recreate a mathematical phase space (in which unknown dynamic processes take place) from time series data only on the basis of measurement. These may have different optimal embedding dimensions depending on whether you also take into account the time derivatives of different arrangements of the signal. Researchers have been looking for correlations between this dimension from certain EEG positions and sleep deprivation. The result indicates that in the awake state, brain processes are less complex when suffering from total sleep deprivation [1].

This technique can be used on all types of signals lacking underlying mathematical models, where you wish to characterize different types of complex or chaotic dynamic states. Applications are also available for ECG.



BIOPAC has implemented chaos features that you find in the Analysis menu of AcqKnowledge 5.

Chaos	▶	Detrended Fluctuation Analysis
Correlation Coefficient		Optimal Embedding Dimension
Electrodermal Activity	▶	Optimal Time Delay
Electroencephalography	▶	Plot Attractor
Electromyography	▶	
Ensemble Average		
Epoch Analysis		
Focus Areas	▶	
Hemodynamics	▶	

Do you or your colleague wish a demonstration or advice in the selection of measurement systems and analysis possibilities?



Please contact responsible for physiological measurement systems:

Fredrik Rådebjörk, fredrik@jor.se, or call +46 (0)18 34 28 20

More about *AcqKnowledge* »

Latest completed and upcoming new webinars:

25/1: **Stimulus Presentation and Event Mark Up with SuperLab**

8/2: **AcqKnowledge Stim Synchronization and Analysis**

Do you miss a webinar from BIOPAC? [See our webinar-archive](#) »

Ref:

(1) **Effect of total sleep deprivation on the dimensional complexity of the waking EEG**

(2) **Attractor**

(3) Chapter 17, Specialized Analysis - Chaos Analysis, *AcqKnowledge* Software Guide

Don't hesitate to contact us at biopac@jor.se with a short description of your situation and we are happy to give you tailored advice!

We also have research systems with more features.



Skulle du föredra att få dessa nyhetsbrev på svenska i fortsättningen?
Skicka ett mejl till biopac@jor.se och meddela oss.

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