

# Quantitative EEG, Event Related Potentials and Neurotherapy

## *In Theory and Practice: Five-Day Workshop*

Hotel Schweizerhof, 7078 Lenzerheide, Switzerland

2010 November 17th-21st

### With Prof. Jury D. Kropotov

*Director of the Laboratory of the Institute of the Human Brain,  
of the Russian Academy of Sciences, St. Petersburg, Russia;  
USSR State Prize Winner.*

*Professor II of the Norwegian University of Science and  
Technology, Trondheim, Norway.*



### Course Description:

Learn how to use QEEG in your clinical practice from the leading scientists!

The goal of the workshop is to teach attendees how to improve their diagnostic and treatment tools by using the newly emerged technology of Quantitative EEG, event related potentials and neurotherapy.

For the first time, we have extended the course from three days to five days in order to allow for enough time for practical work with systems provided for the course.

The course location is a beautiful resort, in a winter sports area.

- Each day will consist of two parts:
  - *Morning:* Lectures on theory, practicing with software on EEG files taken from the HBI reference database
  - *Afternoon:* Working with hardware/software, recording EEGs and analyzing EEG files recorded during the workshop.
- The attendees will be supplied with hardware for recording EEGs. Each attendee will be able to perform recording and analysis by him-/herself.
- The attendees are required to bring laptops with them. At the workshop the attendees will be supplied with an educational software package and EEG files from the HBI (Human Brain Index) reference database.
- Comprehensive course material will be provided.



# Course Schedule

---

## Day 1

### *Morning*

#### **Topics:**

- Mechanisms of the generation of EEG rhythms
- Background EEG as reflection of cortical selfregulation
- What does clinical EEG mean?
- Pathological EEG patterns (slow waves, spikes, paroxysms...) in epilepsy, brain tumors, and some other brain disorders
- Mapping potentials
- Making Low Resolution Electromagnetic Tomography (LORETA and s-LORETA) from the potential maps.

#### **Educational objective:**

Understand the foundations of clinical EEG, namely:

- 1) neuronal basics of brain rhythms generation
- 2) methods of recording and montaging
- 3) distinguish non-EEG artifacts from EEG records,
- 4) correct for artifacts using various approaches available by means of software tools
- 5) distinguish pathological EEG patterns by means of visual inspection as well as by means of automated tools
- 6) use brain maps and s-LORETA imaging for depicting the data.

#### **Procedure:**

Lecture (Power Point presentation is supplied)

Practice with EEG records of healthy subjects and patients from the HBI database (software and EEG files are supplied).

### *Afternoon*

#### **Topics:**

- Recording an EEG in resting state (eyes open, eyes closed, hyperventilation)
- Visual inspection of the EEG recording
- Artifact correction
- Automated spike detection

#### **Educational objective:**

- 1) to place electrodes on the patients' head according to 10-20 system
- 2) to start, to end and to store an EEG recording
- 3) to be able to use the built-in user database to manage the datasets
- 4) to remontage the recording.

**Procedure:** The attendees will be divided into groups. Each group will be supplied with hardware/software for recording and analysis. One of the attendees will serve as a subject (to be recorded) while the others will do recording.

## Day 2

### *Morning*

#### **Topics:**

- Quantitative EEG as a method for neuro-metrics
- QEEG-endophenotypes (biological markers) in healthy population
- QEEG-endophenotypes in brain disorders

#### **Educational objective:**

Methods of spectral analysis, including

- 1) Fourier and wavelet transformations
- 2) coherence
- 3) event related de-synchronization
- 4) show how these methods enable us to reveal QEEG-endophenotypes of brain disorders such as ADHD, dyslexia, anxiety.

**Procedure:** Lecture, practicing with EEG records of healthy subjects and patients from the HBI database.

### *Afternoon*

#### **Topics:**

- Spectral and coherence analysis of EEG recorded on the first day
- Comparing spectral characteristics of recorded EEG with the normative data of the HBI reference database.

#### **Educational objective:**

- 1) to remontage the recording into the HBI database montage
- 2) to perform spectral and coherence analysis
- 3) to compare the results of the analysis with the HBI database
- 4) to make interpretations of the results.

**Procedure:** The attendees will be divided into groups. Each group will be supplied with software for analysis. The analysis of EEG of the subjects recorded on the first day will be done. Spectra, coherence, theta/beta ratios, asymmetry maps for EEGs recorded on the first day will be computed and analyzed.

## Day 3

### *Morning*

#### **Topics:**

- Event related potentials (ERPs) as markers of stages of information flow in the brain
- Association of ERPs components with functioning of brain systems
- Reflection of dysfunctioning of brain systems in ERPs components.

#### **Educational objective:**

Methods of Event Related Potentials, including

- 1) averaging technique
- 2) Independent Component Analysis (ICA), as well as
- 3) to show the discriminative power of ERPs in ADHD, dyslexia, traumatic brain injury.

**Procedure:** Lecture, practicing with EEG records of healthy subjects and patients from the HBI database.

### *Afternoon*

#### **Topics:**

- Recording of EEG in Visual Contingent Performance Task (VCPT)
- Preprocessing of EEG
- Computing ERPs by averaging technique
- Comparison of behavioral parameters (omission and commission errors, latencies and variances of responses) with the normative data of the HBI database
- Comparison of ERPs with the HBI database
- Comparison of ICA components of ERPs with the normative data.

#### **Educational objective:**

- 1) to use Psytask software for presenting tasks provided with the HBI database
- 2) to record EEG in one of the tasks (such as VCPT)
- 3) to compute ERPs and behavioral parameters
- 4) to analyze ERPs visually and to make maps as well as LORETA images of ERPs components, and
- 5) to compare ERPs and ERPs components with the HBI reference database.

**Procedure:** The attendees will be divided into groups. Each group will be supplied with hardware/software for recording and analysis. One of the attendees will serve as a subject (to be recorded) while the others will do recording. An EEG in the VCPT task will be recorded and analyzed.

## Day 4

### *Morning*

#### **Topics:**

- Neurofeedback and tDCS as tools of neurotherapy
- Neurotherapy for peak performance in healthy subjects
- Neurotherapy for correcting cortical dysregulation in brain disorders
- Neurotherapy for correcting disorders of information flow.

**Educational objective:** methods of neurotherapy, including

- 1) QEEG-based neurofeedback
- 2) s-LORETA neurofeedback
- 3) ICA-neurofeedback
- 4) ERP-based neurofeedback
- 5) transcranial Direct Current Stimulation
- 6) Transcranial Magnetic Stimulation (TMS).

**Procedure:** Lecture, practicing with EEG records of patients from the HBI database and constructing neurotherapy protocols.

### *Afternoon*

#### **Topics:**

- Analysis of EEG records made during the first days
- Constructing neurotherapy protocols for peak performance by using the recorded EEG files
- Analysis of EEG records of patients from the HBI reference database
- Constructing neurotherapy protocols for treatment

**Educational objective:** to use the HBI reference database for constructing protocols of neurotherapy.

**Procedure:** The attendees will be divided into groups. Each group will be supplied with an HBI database. The records made during the first days will be analyzed and neurofeedback protocols for peak performance will be suggested. Several records of patients of the HBI database will be analyzed.

## Day 5

### *Morning*

#### **Topics:**

- Overview equipment and software
- How to make a report by yourself
- How to read reports made by HBI experts
- How to monitor the results of treatment
- What service is available
- How can you contribute to the normative database

#### **Educational objective:**

- How to incorporate the learned methodology in the clinical practice
- how to use information obtained by the methodology for diagnosis, treatment and monitoring treatment progress and result

#### **Procedure:**

Lecture: reviewing reports made by the HBImed experts (the template of the report will be supplied).

Practice: comparing the pre- and post EEG spectra and ERPs. At the end the attendees will be given a written multi-choice examination to test the knowledge they have obtained during the workshop.

#### **About the lecturer:**

Prof. Jury Kropotov is a leading and worldwide renowned scientist in the field of quantitative EEG, evoked potentials, neurophysiology and neurotherapy. He is Director of the laboratory of the Institute of the Human Brain of the Russian Academy of Sciences, St. Petersburg. Prof Kropotov is also Professor II of the Norwegian University of Science and Technology, Trondheim, Norway

#### **About HBImed AG:**

HBImed AG is a leading provider of diagnostic tools for mental disorders. It operates the HBI database and provides QEEG report services. HBImed AG is located in Switzerland. Prof. Kropotov is one of the directors of HBImed AG.

#### **About EEG Info:**

EEG Info is a global provider of educational services, equipment, supplies and support to mental health professionals. EEG Info supports HBImed in various aspects such as courses.

## Organizational Notices:

**Date:** 2010, November, 17<sup>th</sup>-21<sup>st</sup>

**Location:** Hotel Schweizerhof, Voa Principala 39, 7078 Lenzerheide/ Lai  
www.schweizerhof-lenzerheide.ch

**Notice:**

The hotel is located in a wonderful landscape in a winter sports area.

**Language:** The course will be held in English.

**Equipment:** Please bring along your Laptop. Be sure to have an adapter for the Swiss system. The QEEG equipment, caps, electrodes, supplies, etc. will be supplied by us. If you already have compatible QEEG equipment, you are welcome to bring it along. We offer as complementary service to check your system and update it where necessary.

**Prices:**

Entire course per person € 1290.-

„Partner rate“: 2 persons & more € 1180.- / person

„Early bird rate“: sign up before August 10th: € 1180.-

„Partner & early bird“: for 2nd person € 1180.-

Single day, per day and person € 290.-

Included in the course fee is:

- Lunch for all five days
- Snacks and beverages in breaks, unlimited coffee
- Course material (*booklet with all slides as well as CD*)

**Accommodation:**

For the duration of the course we have reserved a limited contingent of single rooms at a special price of CHF 240.00 Euro per person and night, including breakfast and dinner. Please let us know if you would like us to book a room for you. **Booking the room with us is possible only as long as the contingent lasts.**

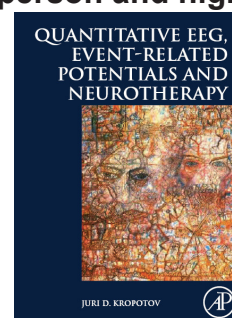
In case you are interested in a double room, please contact us in time. The price for a double bed room, including breakfast and dinner is CHF 220.00 **per person and night.**

**Preparation:**

For maximum learning efficiency, we strongly recommend to read the book “Quantitative EEG, event related potentials and neurotherapy” by Jury D. Kropotov prior to the course.

ISBN 978-0123745125, ca. EUR 54.-

The book is available at various bookstores such as Amazon.com or at EEG Info (www.eeginfo.ch)



# **Quantitative EEG, Event Related Potentials and Neurotherapy**

*In Theory and Practice: Five-Day Workshop*

Hotel Schweizerhof, 7078 Lenzerheide, Switzerland 2010, November 17-21

## **I do sign up bindingly for this workshop:**

\_\_\_ whole seminar

\_\_\_ single days on \_\_\_\_\_

### 1. Attendee

Name/First Name: \_\_\_\_\_

Street: \_\_\_\_\_

ZIP Code/Place/Country: \_\_\_\_\_

### 2. Attendee

Name/First Name: \_\_\_\_\_

Street: \_\_\_\_\_

ZIP Code/Place/Country: \_\_\_\_\_

### 3. Attendee

Name/First Name: \_\_\_\_\_

Street: \_\_\_\_\_

ZIP Code/Place/Country: \_\_\_\_\_

My email address: \_\_\_\_\_

I bring a laptop with the following operating system: \_\_\_\_\_

(date and signature on next page after the fine print)

Please make sure to bring along a laptop and to bring a suitable connector plug/adapter for the **Swiss** system!

We have a limited contingent of single bedrooms at the course hotel.  
Price per single room is CHF 240.00 per person and night, including breakfast and dinner.

**Booking the room with us is only possible as long as our contingent lasts!**

(Please see chapter „Accommodation“ of the course description).

Yes, please book a room for me \_\_\_\_ Number of single rooms \_\_\_\_

Arrival at \_\_\_\_\_ 2010 to Departure at \_\_\_\_\_ 2010

Number of nights \_\_\_\_

No, I don't need a room \_\_\_\_

Contact us if you need a double room or have special requests.

Cancellation/Refund Policy:

1. Course:

We try to offer high quality and convenience to you. As a part of that, we want to allow for your maximum flexibility. Therefore, cancellations made until 30 days prior to the course are free of cost. Cancellations made within 7 to 30 days prior to the course will be subject to a fee of 50% of the course fee. If the cancellation is made within the 7-day period prior to the course, the entire course fee will have to be paid.

2. Hotel room:

In case you requested a hotel room, the cancellation policy is: until 90 days prior to the course: no cost; 89 until 40 days prior to the course: 50% of the room fee is to be paid, 39 until 10 days prior to the course: 90% of the room fee is to be paid, after that, full (all in case the hotel cannot fill the room otherwise).

I sign up for the course, read the cancellation policy and agree with it.

Date and signature: \_\_\_\_\_

Mail this form to:	Or fax:	Or eMail:
HBImed AG Husenstrasse 57 CH-9533 Kirchberg Switzerland	+41 (71) 931 46 17 or +49 (9131) 532 558	course@hbimed.com or kurs@hbimed.ch