

# Overview Tutorials

Monday + Tuesday (15:00 – 17:00)

## General Timetable

	Monday, 05.03.2018	Tuesday, 06.03.2018	Wednesday, 07.03.2018
Sound Quality of Audio Systems	9:00 -10:30	9:00 -10:30	9:00 -10:30
Break	10:30 - 10:45	10:30 - 10:45	10:30 - 10:45
Sound Quality of Audio Systems	10:45 - 12:00	10:45 - 12:00	10:45 - 12:00
Lunch	12:00 - 13:00	12:00 - 13:00	12:00 - 13:00
Sound Quality of Audio Systems	13:00 - 14:30	13:00 - 14:30	13:00 - 14:30
Break	14:30 - 14:45	14:30 - 14:45	14:30 - 14:45
Sound Quality of Audio Systems			14:45 – 16:00
Tutorials	15:00 - 17:00	15:00 - 17:00	No Tutorials offered on Wednesday
	1) Hands-on Tutorial Nonlinear Speaker Control Part 1	1) Hands-on Tutorial Nonlinear Speaker Control Part 2	
	<b>or</b>	<b>or</b>	
	2) dB-Lab: Effective Project Management and Hidden Features	3) Statistical Analysis of Measurement Results	
	<b>or</b>	<b>or</b>	
	4) Sensitive Rub&Buzz Tests	5) Suspension Part Testing	
	<b>or</b>	<b>or</b>	
	6) Live Audio Analyzer	7) Optimizing Simulation of Cone Vibration with Scanner Data	
	<b>or</b>	<b>or</b>	
8) Anechoic Tests in Normal Rooms	9) Large Signal Testing in R&D and QC		

### 1) Hands-on Tutorial Nonlinear Speaker Control

This tutorial gives an introduction into adaptive loudspeaker control and how it can be used to equalize, stabilize, linearize and protect transducers.

#### Topics addressed in this tutorial:

- Practical application of nonlinear adaptive loudspeaker control
- Extending the limits of passive loudspeakers by digital signal processing
- Introduction on speaker control with live demonstrations and measurements
- Adaptive Parameter Identification
- Reliable Speaker Protection
- Nonlinear Distortion Compensation
- Stabilization of Voice Coil Position
- Consequences for Transducer and Amplifier Design

## 2) dB-Lab: Effective Project Management and Hidden Features

Learn how to utilize the features and structure of dB-Lab to organize your development projects, measurements and templates!

### Topics addressed in this tutorial:

- Folders, Objects and Operations: how to organize your Measurements on different Levels
- Working with Klippel provided Measurement Templates
- Organize and share your Measurement Setups in Templates
- New Features and Maintenance with Klippel KA3

## 3) Statistical Analysis of Measurement Results

Learn from Production and find Needles in the Haystack!

### Topics addressed in this Tutorial:

- Determine Statistical Values (mean, standard deviation, ...) of Measurement Results
- Group Test Objects in good/borderline/bad categories
- Apply Automatic Classification to identify Golden Defects
- Calculate Production Limits and close the loop to QC

## 4) Sensitive Rub&Buzz Tests

### Topics addressed in this tutorial:

- Practical Demo of Woofer and passive Box
- Practical Meta Hearing Demo and Explanation
- Time Frequency Analysis of Rub&Buzz defects
- Transfer Function Analysis of defects with laser mic mapping
- Listening to the fine structure (Root Cause Analysis)

## 5) Suspension Part Testing

The Sum of its Elements – identify the Performance of Suspension Parts

### Topics addressed in this tutorial:

- Practical Measurements for Soft Parts (spider, cone, small membrane of microspeaker, passive radiator)
- Dynamic Testing of Linear and Nonlinear Parameters
- Dedicated to R&D and End-of-Line Testing

## 6) Live Audio Analyzer

How does your defect sound when playing music? A practical guide from measurement to auralization.

### Topics addressed in this tutorial:

- Practical Evaluation of problems of the Audio System with music
- Measurement of state of the Audio System (u,l,x,p)
- Isolation of the Acoustical Symptom for the selected music
- Short Introduction to Auralization Methods

## 7) Optimizing Simulation of Cone Vibration with Scanner Data

A Practical introduction to the Measurement of Cone Vibration.

### Topics addressed in this tutorial:

- Short Overview of Scanner Software
- Deploying Modal Analysis for deeper understanding of Cone Vibration
- Optimizing Material Parameter of FEA models bringing together Simulation and Measurement

## 8) Anechoic Tests in Normal Rooms

### Topics addressed in this tutorial:

- Performing Directivity Measurement in Normal Rooms
- Practical Near-Field-Scanner Measurement of a Transducer mounted in a Baffle
- Fast non-anechoic Measurement – how to use a Compensation Filter to measure non-linear symptoms in a Normal Room
- Practical Measurement Examples: CEA 2010 maximum SPL Test (Peak CEA2010 A + continuous CEA2010 B)

## 9) Large Signal Testing in R&D and QC

### Topics addressed in this Tutorial:

- Common Features and Differences between Large Signal Identification and Motor + Suspension Check
- What is relevant in R&D and what in QC
- Linking R&D and QC (practical demo)
- Coil Offset: Symmetry Point vs. Relative Definition
- Why testing nonlinear Parameters and not only Symptoms in End-of-Line Test (SIM example)