



Ears Project

Newsletter

July
2012

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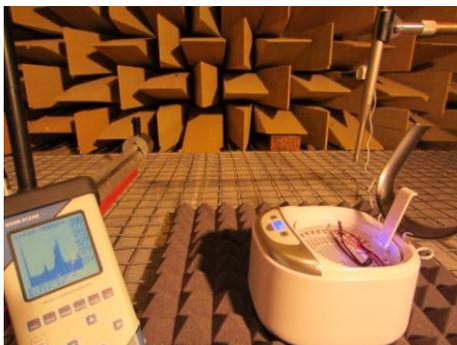
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Sound pressure measurement on a
cleaning vessel

Welcome

This is the first newsletter of the project “Metrology for a universal ear simulator and the perception of non-audible sound”, and I warmly welcome you as a person interested in our work. We are happy to come into contact with all potential users of knowledge obtained and provided within this project, and we try to inform you periodically about news and events.

The project focuses on two topics of hearing conservation which have gained only moderate attention until now. First, sound and noise outside of the frequency range of hearing can create annoyance or present even a hazard to hearing. Second, the grown interest in testing of hearing ability of neonates and children has made evident its lack of sufficient metrological underpinning since no suitable ear simulator is commonly available on the market for infants. The project will develop both assessment strategies for non-audible noise and a universal ear simulator suitable for children and adults.

The project is funded within the European Metrology Research Programme (EMRP). It brings together various partners working in metrology from national metrology institutes, industry, and academia for a solution of problems of common interest and with global European significance.

I hope you will find valuable information in the newsletter. We are interested to keep in contact with you as stakeholders, users, or interested persons, and we are looking forward welcoming you in our project community.

Christian Koch
Coordinator





News and facts

- Project started at 1 May 2012.
- Official website of the project launched: You find us at www.ears-project.eu.
- The next project meeting will take place in Teddington (UK) at 23/24 October. Collaborators are invited to join at the second day.

Vision of the project

The vision of the project is

- the improvement of preventative strategies for hearing conservation for a better quality of life,
- the creation of new fundamental understanding of auditory perception of non-audible noise,
- the determination of minimum permission sound pressure levels for better assessment of non-audible noise,
- the development of a universal ear simulator for better earphone calibration, and
- the underpinning of hearing assessment methods including newborns and children.

Work packages

The project work is divided into five main steps called work packages. The first bundle of three (WP1 – WP3) aims to establish both, a new understanding of human perception of non-audible sound and a metrology infrastructure necessary to put in place effective safety criteria. The second bundle (WP4 & WP5) aims to improve the relevance of metrology in modern audiological practice, to bring about improved quality and reliability of results.

Workpackage 1 will develop new methods and technology for the determination of brain responses using magnetoencephalography (MEG) and functional magnetic resonance imaging (fMRI) to non-audible sound. New transducers appropriate for delivering and measuring the acoustic stimuli will also be developed.

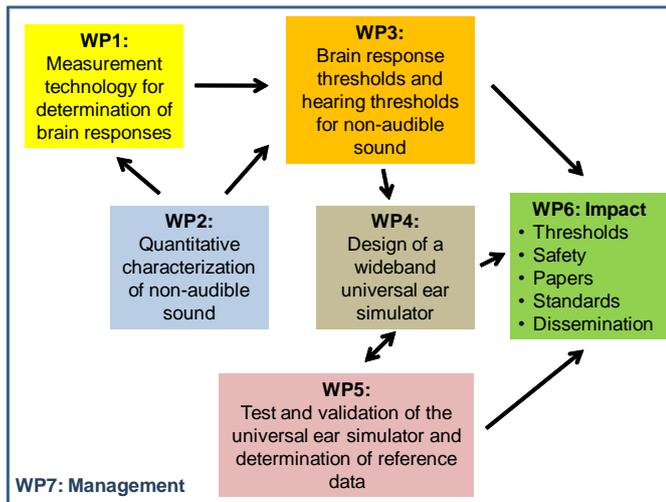
Workpackage 2 will develop new measurement methods and calibration techniques for non-audible sound, including a new primary standard for airborne ultrasound, thereby providing traceability for noise measurement in this part of the frequency range.

Workpackage 3 will compare brain response measurements and hearing thresholds, which will generate new understanding of the perception mechanisms, and underpin the determination of safe exposure limits for non-audible sound.

Workpackage 4 will operate a process of user requirement, specification, modeling, design and production of a new prototype universal ear simulator.



Workpackage 5 will develop new calibration methods and determine reference equivalent threshold sound pressure levels for the universal ear simulator. A selection of clinical users will then be engaged to evaluate the new device in audiological practice and provide valuable feedback on usability. Then, a standardization process will be initiated.



Sketch of project organization

Consortium

In the consortium 5 national metrology institutes and one designated institute are amalgamated under the coordination of Physikalisch-Technische Bundesanstalt (PTB):



Physikalisch-Technische Bundesanstalt (PTB)

Brüel & Kjaer Sound and Vibration Measurement A/S (BKSV)



Dansk Fundamental Metrologi (DFM)

Laboratoire nationale de métrologie et d'essais (LNE)



National Physical Laboratory (NPL)

TUBITAK Ulusal Metroloji Enstitüsü (UME)



Business card of partners: Physikalisch-Technische Bundesanstalt

In this column of every newsletter we will introduce you to one of the institutes of the consortium. Today: Physikalisch-Technische Bundesanstalt (PTB).

The PTB is the national metrology institute providing scientific and technical services and the highest technical authority of Germany for the field of metrology and certain sectors of safety engineering. It comes under the auspices of the Federal Ministry of Economics and Technology. PTB performs fundamental research and development work in the field of metrology as a basis for all the tasks entrusted to it in the areas concerning the determination



of fundamental and natural constants, the realization, maintenance, and dissemination of the legal units of the SI, safety engineering, services and metrology for the area regulated by law and for industry. Only fundamental research work performed by PTB itself using latest technologies will enable it to ensure on a long-term basis its metrological competence recognized on the international level, and to extend it further.

Major areas of technical expertise and experimental activity of PTB comprise the research in acoustics, mainly on sound field characterization and measurement, and audiology including its metrological underpinning. Within Germany, annual testing of audiometric devices is obligatory and PTB is providing traceability for all ear simulators used. These activities are accompanied by the determination of hearing thresholds which has been a long-term expertise of PTB. Because the sound department of PTB includes an ultrasound working group, there are close relations to and experience in measurement of air-borne ultrasound.

The activities in medical physics focus on new measuring techniques and testing procedures for medical diagnostics. In particular, physics based methods such as magnetoencephalography and -cardiography (PTB Biomagnetic Center in Berlin), laser-assisted measuring techniques, NMR-tomography and -spectroscopy are further developed both by designing new hardware devices and new analysis procedures. Furthermore, testing devices and reference materials for quality assurance in diagnostics and therapy are developed and calibrated.

Visit PTB at www.ptb.de



Premises of PTB in Braunschweig (Germany)

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