



# EINLADUNG

zum Vortrag im Rahmen des Seminars des SFB/TRR 31

**Freitag, 16. November 2012, 14:00 Uhr**

im Raum W2 1-143 der Universität Oldenburg  
und Raum H28 / R 2.31 des Med. Campus Magdeburg  
(per Videoübertragung)

***“Methods to eliminate stimulus transduction artefact from insert earphones during electroencephalography”***

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## **ABSTRACT**

500 million people worldwide experience some form of hearing impairment. One of the most complex tasks that our minds perform upon a daily basis is that of speech perception in noise; a task that is increasingly difficult with age and hearing impairment<sup>[1]</sup> such that background noise can become a serious challenge to speech communication. Speech perception in noise depends upon what we can hear, see, and know. Psychophysical and electrophysiological measures could offer biomarkers for hearing impairment that improve specificity for treatment outcome.

Here, ordinary computer and EEG equipment is used to obtain Auditory Brainstem Responses (ABRs) and Auditory Middle-Latency Responses (AMLRs) to brief click stimuli, but also those to the onset of /da/ stimuli. /da/ also elicited a candidate origin of such biomarkers for hearing impairment, the complex Auditory Brainstem Response (cABR) that overlaps AMLRs and reflects the ongoing response to landmarks in the acoustical waveform after the onset of the sound<sup>[2]</sup>. Approaches are evaluated to eliminate transduction artefact induced by currents within an ER4-B earphone wire. This artefact is related to the acoustical stimulus waveform and would otherwise contaminate the recording of the stimulus-related cABR. Counter-phasing, grounded-shielding, and re-referencing are all shown to be effective approaches to the elimination of stimulus transduction artefact. A combination of approaches is recommended.

## **REFERENCES**

[1] Wilson R.H., Weakley, D.G. (2005). The 500 Hz masking-level difference and word recognition in multitalker babble for 40-to 89-year-old listeners with symmetrical sensorineural hearing loss. *Journal of the American Academy of Audiology*, 16(6), 367-382.

[2] Campbell T.A., Kerlin, J.K., Bishop C.W., & Miller, L.M. (2012). Methods to eliminate stimulus transduction artifact from insert earphones during electroencephalography. *Ear & Hearing*, 33, 44-50. doi: 10.1097/AUD.0b013e3182280353