

Master's Thesis: Auditory Evoked Potentials

The Experimental Audiology Lab (exalab) is looking for a motivated student for a master's thesis in the field of Auditory Evoked Potentials starting from 15th March 2024 or later.

Background and aim

The measurement of broadband "click" Auditory Evoked Potentials is a clinically established non-invasive method to evaluate the hearing abilities of patients, which might be cooperative or in-cooperative (e.g., children less than 4-5 years) using skin electrodes.



Because of the low Signal-/Noise ratio (- 30 dB and less) it is actually difficult to measure electric responses to acoustic stimuli in the frequency range between 70 Hz and 500 Hz, though the human ear generates electric responses at these frequencies.

After signal generation in the cochlea, the auditory responses are transmitted as action potentials along different neural structures, e.g., the ventral cochlea nucleus and the superior olivary complex to the colliculus inferior. Therefore it should be possible to analyze these activities by phase detection algorithms at single low frequencies.

Tasks of the thesis

- Test setup implementation based on an existing biosignal amplifier, analog-digital and digital-analog converters, signal-processing unit and software
- After implementation of the measurement set-up, new signal processing algorithms using MATLAB will be tested.
- Documentation and thesis writing

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