E I N L A D U N G

zum Vortrag im Rahmen des Seminars des SFB/TRR 31

Freitag, 19. Juni 2009, 14 Uhr c.t.

im Raum W2 1-143, Universität Oldenburg

und im Raum G26.1 – 010, Rechenzentrum
der Universität Magdeburg (per Videoübertragung)

"Putting Sounds in Context"

Jennifer F. Linden

UCL Ear Institute and Department of Neuroscience,
Physiology & Pharmacology, University College London

Responses of neurons in the auditory system are known to be influenced by acoustic context. In the auditory cortex, contextual effects such as forward suppression and combination sensitivity have previously been studied primarily with simple sounds, such as two-tone stimuli. We have recently proposed a new way to characterize auditory cortical responses to complex sounds (Ahrens et al., J Neurosci 28:1929, 2008), which makes it possible to explore contextual modulation within neuronal responses to spectrotemporally rich and dynamic stimuli. Our "context models" incorporate nonlinear effects of short-term acoustic context, and identify a "contextual re-weighting field" (CRF) modulating the efficacy of spectrotemporal elements within the stimulus. In this talk, I will discuss context models of rodent auditory cortical responses to dynamic random chord stimuli, and present evidence for three discoveries arising from analysis of the CRFs. First, near-simultaneous tones separated by approximately half an octave evoke potent excitatory nonlinear contextual effects in auditory cortex. Second, the delayed effects of acoustic context, such as suppression by preceding same-frequency tones, differ between the primary auditory cortex and the anterior auditory field. Third, behavioral training involving spectrotemporally complex sounds can alter nonlinear contextual modulation of auditory cortical responses, even if the training has had no apparent impact on linear stimulus-response functions (e.g., STRFs). These results suggest that nonlinear modulation of neuronal responses by acoustic context is an essential aspect of auditory cortical processing and plasticity.