

## **Internoise 2015**

**Title:** Calculating tonality of IT product sounds using a psychoacoustically-based model

**Author:** Dr. Roland Sottek, HEAD acoustics GmbH

### **Abstract:**

For many years in product noise assessments and particularly in the Information Technology field, tonality measurement procedures such as the Tone-to-Noise Ratio, Prominence Ratio and DIN 45681 Tonality have been available to quantify the audibility of prominent tones. Through the recent past as product sound pressure levels have become lower, disagreements between perceptions and measurements have often increased. One factor is that tonality perceptions can and do arise from spectrally-elevated noise bands of various widths and slopes as well as from pure tones, and escape measure in tools sensitive only to tones. Near-superpositions of discrete tones and elevated noise bands are increasingly found in low-level technical sounds. Some methodologies tend to misrecognize an elevated noise band as general masking lowering the audibility of a tone in the spectral vicinity, whereas perceptually such phenomena add. To address such issues, a new psychoacoustically-based tonality calculation method based on a hearing model of Sottek is presented which evaluates the nonlinear and time-dependent specific loudness of both tonal and broadband components, separating them via the autocorrelation function. This model has been validated by many listening tests. The model's background and current state are presented, with special attention to Information Technology issues such as elevated-band-related "indiscrete" tonalities and superpositions of such tonalities with discrete tones.

Find more event abstracts in our >> [abstracts archive](#) <<

HEAD acoustics GmbH  
Ebertstraße 30a  
52134 Herzogenrath, Germany