

## Aurally Relevant Analysis by Synthesis - VIPER a New Approach to Sound Design -

Peter Daniel(Cortex) / Patrice Pischedda(01dB-Stell)\*

### ABSTRACT

VIPER a new tool for the VISual PERception of sound quality and for sound design will be presented. Requirement for the visualization of sound quality is a signal analysis modeling the information processing of the ear. The first step of the signal processing implemented in VIPER, calculates an auditory spectrogram by a filter bank adapted to the time- and frequency resolution of the human ear. The second step removes redundant information by extracting time- and frequency contours from the auditory spectrogram in analogy to contours of the visual system. In a third step contours and/or auditory spectrogram can be resynthesised confirming that only aurally relevant information were extracted. The visualization of the contours in VIPER allows intuitively to grasp the important components of a signal. Contributions of parts of a signal to the overall quality can be easily auralized by editing and resynthesising the contours or the underlying auditory spectrogram. Resynthesis of time contours alone allows e.g. to auralize impulsive components separately from the tonal components. Further processing of the contours determines tonal parts in form of tracks. Audible differences between two versions of a sound can be visually inspected in VIPER through the help of auditory distance spectrograms. Applications are shown for the sound design of several interior noises of cars.

**Key Words** : sound design, sound quality, tonalness, impulsiveness

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\* 01dB-Stell, patrice.pischedda@01db-stell.com