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For current and future experiments at the Department of Acoustics of Aalborg University, it is desired to monitor possible changes in the distortion product otoacoustic emissions (DPOAEs) of human subjects after sound exposures, in particular changes in the fine structures. The methods previously used (using the commercial system ILO96 from Otodynamics), has covered frequencies from 1 kHz to 6 kHz, with an averaging time of 2.6 seconds for each primary presented (f1 and f2). This leads to a total measuring time of approximately 30 minutes (e.g. Reuter and Hammershøi, 2004, 2005a, 2005b). Measurements performed in this way are impractical for the correct assessment of sound exposure effects, as changes within the cochlea may occur much faster.

An experiment was conducted in order to test if it is possible to develop a faster, but still reliable, measuring method by changing the averaging time in the presentation of the primaries. The methods compared are:

1. **DPOAE30**−the traditional setup. The averaging time is 1.3 s per primary, and two sweeps are performed, which leads to 2.6 s per primary. The total measurement duration is approximately 30 minutes.
2. **DPOAE5**, with an averaging time of 0.7 seconds per primary resulting in a total measurement duration of approximately 5 minutes.

The methods also differ in how the frequency range is covered:

- DPOAE30 splits the frequency range in 19 windows. Windows below f2 < 3.1 kHz have a bandwidth of 200 Hz and 17 primary tones are presented per window. The measurement is done in ascending order with f2 steps of around 12 Hz. Windows above f2 > 3.1 kHz have a bandwidth of 400 Hz. 17 primaries are presented in ascending order in f2 steps of around 24 Hz.
- DPOAE5 splits the frequency range in two adjacent windows at f2 = 3.125 kHz. The measurement is performed in descending steps of 12 Hz for f2 < 3.125 kHz and ascending steps of 24 Hz for f2 > 3.125 kHz.

The central parameters of the DPOAE measurements are however the same:

- Frequency range: 1 kHz−6 kHz
- L1/L2 = 65/45 dB
- f2/f1 = 1.22

This poster will present the results for the two different setups from measurements performed on 6 subjects (3 males, 3 females). All subjects had pure-tone hearing levels below 20 dB and normal middle-ears. For each subject the session consisted on one measurement of DPOAE according to setup DPOAE30 and two measurements according to setup DPOAE5. The order of the measurements was balanced as shown in Table 1. Measurements were done only in the right ear and without refitting the probe.

Table 1. Measuring order, subjects 1..3 are females, while subjects 4..6 are males.

Subject 1−4	Subject 2−5	Subject 3−6
DPOAE30	DPOAE5	DPOAE5
DPOAE5	DPOAE30	DPOAE5
DPOAE5	DPOAE5	DPOAE30

The comparison will be done according the following paradigms:

1. Similarities between DPOAE30 and DPOAE5
2. Influence of the background noise. Shorter averaging time is expected to result in a lower S/N.
3. Ability of setup DPOAE5 to detect fine structures
4. Inherent errors due to differences in the methodology
5. Repeatability of 5 minutes measurements

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