

Influence of the Depth of Human Ear Canal on Sound Pressure Distribution

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Abstract

This study was to measure the sound pressure distribution by examining the ear canal resonance in the human ear canals. The mean gain for various stimulus frequencies was analyzed at four different measuring points. A comparative evaluation showed that the mean gain for different stimulus frequencies at a depth of 2.0 cm was consistent with the results of Dillon' s study. In addition, it found that the mean gain at a stimulus frequency of 4000 Hz was affected by the interior shape of the ear canal, particularly at the depths of 0.5 cm and 1.0 cm, while mean gain was only affected by the length of the ear canal for the stimulus frequency of 2000 Hz. The findings of this study may have potential clinical applications for the selection and fitting of in-the-canal and completely-in-the-canal hearing aids, as well as for canalplasty and congenital aural atresia surgery.

Keyword : Sound pressure, External auditory canal, Ear canal resonance,
Real ear measurement