A case-study on the continuous use of an in-ear dosimetric device

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    - Sound pressure
    - Deafness
    - Hearing protection
ABSTRACT

In order to further understand the combined effects of occupational and recreational noise exposure with regards to noise induced hearing loss (NIHL), an in-ear dosimeter prototype meant for continuous use was developed. The device acts as a hearing protection device (HPD) and can measure and log effective in-ear sound pressure level as well as unprotected levels. To enable its continuous use, this HPD is also equipped with a bypass feature for “transparent” hearing, input for music or communication devices and interfaces with Android smartphones. The proposed device allows for the implementation of an algorithm accounting for the auditory fatigue recovery rate, providing a true representation of the current accumulated noise dose. This allows for 24 h dosimetry and avoids having the user manually reset the dose back to 0% on the next day and thus assuming complete fatigue recovery has occurred. This
paper details the proposed recovery algorithm, presents collected field data, and discusses the benefits as well as real-world challenges of using such a device.